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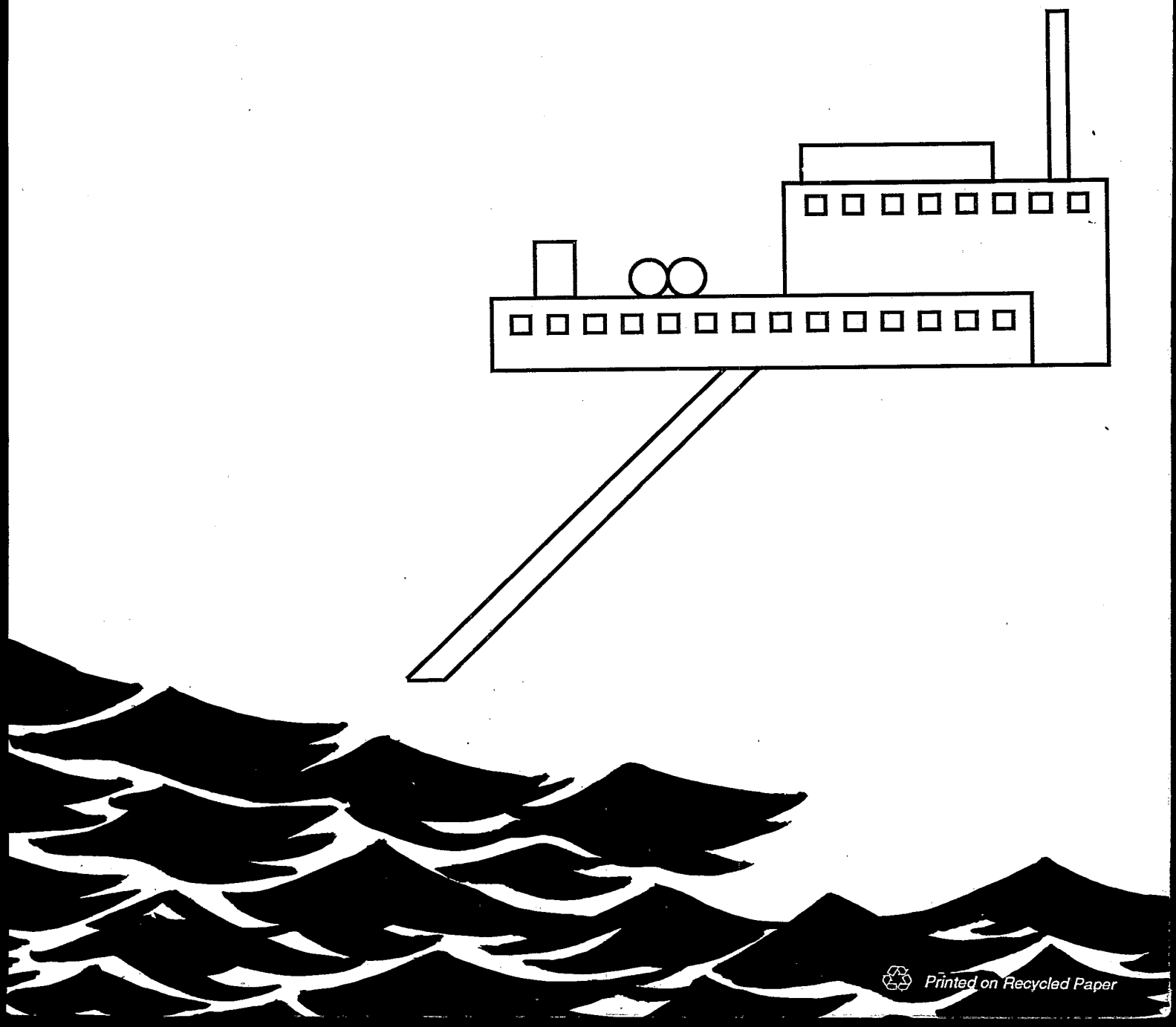
Report to Congress on Implementation of Section 403(c) of the Federal Water Pollution Control Act



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Executive Summary

Under the authority of the Clean Water Act (CWA), the U.S. Environmental Protection Agency (EPA) or its authorized agencies (certain states) issue National Pollutant Discharge Elimination System (NPDES) permits to discharge into navigable waters if the discharge meets all applicable requirements of the law. Section 403 of the CWA sets out criteria applicable to discharges into the territorial seas, contiguous zone, and the ocean. For these dischargers, the permit issued by the Agency must, in addition to other applicable requirements, satisfy the ocean discharge criteria as set out in 40 CFR 125.120-124.

In section 1007 of the Ocean Dumping Ban Act of 1988 (ODBA), Congress requested a report from EPA on the implementation of section 403(c) of the CWA. Congress specifically requested the following information about the program:

(1) an accounting of discharges into the waters of the territorial sea, the contiguous zone, and the ocean, including -

(A) the total number of discharges;

(B) the location, source, volume, and potential environmental effects of each discharge;

(C) the date of original issuance, review, and reissuance of each discharge permit; and

(D) the number of discharges that have been determined by the Administrator to be in compliance with the ocean discharge criteria regulations promulgated pursuant to section 403(c) of the CWA;

(2) a schedule for implementing section 403(c) of the CWA and achieving compliance with guidelines promulgated under section 403(c) as expeditiously as practicable, and an estimate of the resources required to meet such schedule; and

(3) recommendations for any additional legislative authorities needed to achieve compliance with such guidelines.

This report, which responds to Congress' request for information, is organized into the following chapters:

- **The 403(c) Program**
- **Inventory of 403(c) Ocean Dischargers**
- **403(c) Status by Region**
- **Overview of Regulations for Discharges to Marine Waters**
- **403(c) Implementation Plan/Schedule**
- **Findings and Conclusions.**

There are also appendices which define terms and acronyms, describe categories of discharges, and list each discharger by location. A summary of each of the chapters follows.

The 403(c) Program: Section 403(c) of the CWA provides that no NPDES permit for discharges to the "territorial sea, the waters of the contiguous zone, or the oceans" shall be issued except in compliance with the ocean discharge guidelines. The guidelines are used to determine whether or not a discharge will cause degradation of those waters. The factors which the Act requires EPA to consider are:

(A) The effect of disposal of pollutants on human health or welfare, including but not limited to plankton, fish, shellfish, wildlife, shorelines and beaches;

(B) the effect of disposal of pollutants on marine life, including the transfer, concentration, and dispersal of pollutants or their byproducts through biological, physical, and chemical processes; changes in marine ecosystem diversity, productivity, and stability; and species and community population changes;

(C) the effect of disposal of pollutants on aesthetic, recreation, and economic values;

(D) the persistence and permanence of the effects of disposal of pollutants;

(E) the effect of the disposal at varying rates, of particular volumes and concentrations of pollutants;

(F) other possible locations and methods of disposal or recycling of pollutants including land based alternatives; and

(G) the effect on alternate uses of the oceans, such as mineral exploitation and scientific study.

Ten factors which the Agency must consider when making a determination of unreasonable degradation (See box below) were published as part of the Ocean Discharge Criteria regulations in the Federal Register (45 FR 65457, October 3, 1980); 40 CFR Part 125 Subpart M. These regulations hinge on two determinations. The first, derived directly from the statute, is whether a discharge will or will not cause unreasonable degradation to the marine environment. If there is insufficient information to make this determination, the permitting agency may evaluate whether or not irreparable harm will result from the discharge. Before a permit may be issued under the irreparable harm test, the applicant must also demonstrate that there are no reasonable alternatives to the ocean discharge and must comply with all permit conditions including effluent toxicity limits, specifications of an ongoing monitoring program, and other permit limitations.

OCEAN DISCHARGE GUIDELINES

(1) Quantities, composition, and potential bioaccumulation or persistence of the pollutants to be discharged;

(2) Potential transport of the pollutants by biological, physical, or chemical processes;

(3) Composition and vulnerability of potentially exposed biological communities, including
- unique species or communities,
- endangered or threatened species,
- species critical to the structure or function of the ecosystem;

(4) Importance of the receiving water area to the surrounding biological community, e.g.
- spawning sites,
- nursery/forage areas,
- migratory pathways,
- areas necessary for critical life stages/functions of an organism;

(5) The existence of special aquatic sites, including (but not limited to)
- marine sanctuaries/refuges,
- parks,
- monuments,
- national seashores,
- wilderness areas,
- coral reefs/seagrass beds;

(6) Potential direct or indirect impacts on human health;

(7) Existing or potential recreational and commercial fishing;

(8) Any applicable requirements of an approved Coastal Zone Management Plan (CZMP);

(9) Such other factors relating to the effects of the discharge as may be appropriate;

(10) Marine water quality criteria.

The 403(c) regulations list 10 major criteria permitting authorities must consider when issuing NPDES permits for direct ocean discharges. These criteria are intended to determine the potential degradation of the territorial seas, contiguous zone, and oceans. Section 403(c) also provides the Regions and States broad authority to impose controls on ocean discharges. Significantly, section 403 also requires the evaluation of alternatives to the discharge and may require changes in process, if necessary to assure no unreasonable degradation to the marine environment.

The implementation of section 403(c) has evolved since its inception in 1972. Initial priorities for implementing section 403(c) were focused on offshore oil and gas activities because these accounted for the largest number of direct ocean discharges.

Historically, the Agency has also focused on discharges to fresh water systems where impacts were believed to be more critical on a national scale. Federally supported research to develop the scientific methods and tools necessary to assess impacts has also focused on fresh water systems. However, the Agency has also developed a strategy for the Nation's estuaries and near coastal waters as the importance and sensitivity of these waters has become more evident than before. These waters tend to receive the bulk of the Nation's pollutants from both point and nonpoint sources. At the same time, the technical and scientific tools available to assess pollutant behavior and biological impacts in estuarine and marine waters have evolved substantially over the last decade and continue to advance.

Inventory of 403(c) dischargers: To respond to section 1007 of the ODBA, it was necessary to access a variety of information sources, including:

- EPA's Permit Compliance System (PCS);
- NOAA's National Coastal Pollutant Discharge Inventory (NCPDI); and
- permit information available directly from the 403(c) coordinators in the seven EPA coastal regions.

There are two permit categories under the NPDES program: individual permits and general permits. An individual permit normally involves one or more stationary outfalls (pipes) discharging from a single facility. A general NPDES permit, under 40 CFR 122.28, may be written to regulate multiple point sources which have the same or similar types of operations, discharge the same or similar types of wastes, and require the same or similar effluent limitations and monitoring conditions. Among the general permits issued by the Agency are permits covering discharges from offshore oil and gas extraction and seafood processing.

There are approximately 540 individual discharges that are potentially subject to section 403(c). At the time of this writing, EPA is not able to categorize whether or not approximately 217 of the 540 are subject to 403(c) for one of two reasons: either the baseline or the latitude and longitude of the outfall are unknown. The baseline is defined in section 502(a) of the CWA to be the -

> "belt of the seas measured from the line of ordinary low water along that point of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland water...:

Section 403(c) applies to all discharges beyond (seaward of) the baseline. However, the complex coastal geography of some states, Alaska in particular, prevents an easy determination of the baseline. The State Department makes determinations for these dischargers on a case-by-case basis. Most of the undetermined 403(c) dischargers are small village POTWs.

Of the known 323 dischargers under individual permits subject to 403(c), 53% are sewage treatment facilities, 10% are industrial plants discharging conventional pollutants (biological oxygen demand, total suspended solids, pH, fecal coliform, and oil and grease), 27% are industrial plants discharging toxic pollutants, and 10% are electric facilities. Due to sheer dominance by volume and the tendency for POTWs to receive industrial effluent, sewage treatment accounts for the vast majority of both conventional and toxic pollutants on a national scale.

All the general permits subject to 403(c) requirements, except one which is issued for seafood processing, have been written for offshore oil and gas activities. There are nine oil and gas exploration permits covering activities located in the Gulf of Mexico and offshore Alaska and California.

The impact of any discharge depends on a number of factors, among which are the volume and rate of flow, pollutant types, water depth, current speed, and proximity to sensitive ecological zones. Below is a synopsis of the typical potential effects of each of the major types of 403(c) dischargers:

Publicly Owned Treatment Works (POTWs): Pollutants: Solids, chlorine, biochemical oxygen demand (BOD), toxic pollutants, fecal coliform bacteria, and various pathogens. Potential impacts: deterioration of water quality and aesthetics, alteration of the biocommunity due to nutrient enrichment and degraded or enriched sediment quality, bioaccumulation of priority pollutants and other toxic substances in commercially and recreationally harvested fish, shellfish, and plants, and restrictions on water contact activities due to contamination by pathogens.

Offshore Oil and Gas Activities: Pollutants: drilling fluids (chrome or ferrochrome lignosulfonate, sodium hydroxide, diesel oil, mineral oil, biocides, surfactants and emulsifiers), drill cuttings, and produced waters. Potential impacts: burial of benthic communities due to settling of drilling muds and cuttings, and uptake of metals.

Seafood Processors: Pollutants: solids, oil and grease, BOD, chlorine, ammonia, and fecal coliform bacteria. Potential Impacts: degradation of water quality by oxygen depletion, sulfide production, ammonia generation, nutrient enrichment, aesthetic degradation, suffocation of benthic communities, benthic infauna mortality or stress, alteration of the fish communities, and algal blooms.

Offshore Placer Mining: Pollutants: lead, nickel, arsenic, copper, mercury, solids, and total solids. Potential Impacts: excessive turbidity, increased bioavailability of toxic metals, burial of benthic communities, and obstruction of anadromous fish migration.

Log Transfer Facilities: Pollutants: wood debris, oil, grease, and small amounts of other petroleum products, entrained soil and particulate matter. Potential impacts: degradation of water quality by suspended solids, turbidity, settleable solids, floating solids, oil and grease, leachates, increased BOD and chemical oxygen demand (COD), elevated concentration of toxic degradation products, and reduced subsurface circulation. Also smothering of bottom plants and animals, elimination of epifauna, and adverse changes in the communities of the king crab, Dungeness crab, halibut, and salmon.

Seawater Treatment Plants: Pollutants: total suspended solids (TSS), spent coagulants, total residual chlorine (TRC), chlorine reaction products, and floatable solids. Potential impacts: change in diversity and abundance of benthic organisms due to altered sediment characteristics (e.g., grain size) or sediment deposition.

Cane Sugar Mills: Pollutants: TSS, floatable solids, and BOD. Potential impacts: increase in suspended solids and sedimentation causing mortality of benthic infauna, changes in benthic species composition, alterations in fish communities, and smothering and/or growth inhibition of coral communities.

Petroleum Refineries: Pollutants: oil and grease, phenolic compounds, TSS, ammonia, sulfide, total and hexavalent chromium, BOD and COD. Potential impacts: biological community stress due to oxygen depletion, nutrient enrichment, increased sedimentation or turbidity, and elevated concentrations of oil and grease and priority pollutants.

Pulp and Paper Mills: Pollutants: suspended solids, BOD, priority pollutants, dioxins, furans, other toxic substances (resin acids), and high acidity. Potential impacts: oxygen depletion, altered substrate, and bioaccumulation of toxic substances (resin acids, chlorinated phenolic compounds, and 2378-TCDD (dioxin)).

Sawmills: Pollutants: cyanide, settleable matter, coliform bacteria, ammonia, BOD, suspended solids, and oil and grease. Potential impacts: biological stress due to oxygen depletion, nutrient enrichment, increased sedimentation or turbidity, and elevated concentrations of oil and grease and priority pollutants.

403(c) Program Status by Region: Implementation of the 403(c) program is the responsibility of EPA Regional Offices and NPDES approved States (when authorized by EPA). States using the EPA 403(c) guidelines that are approved for NPDES permitting are Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, California, Hawaii, Oregon, and Washington. Permit writers generally rely on available information to determine whether or not a discharge would cause unreasonable degradation and the depth of the evaluation for the ocean discharge criteria depends heavily on the availability of resources and competing program priorities. In general, highest priorities for compliance reviews have been for general permits, major discharges, and discharges in or near known ecologically sensitive zones.

Based on information received from the EPA coastal Regions (I, II, III, IV, VI, IX, and X) many of the major ocean dischargers subject to 403(c) reviews are in compliance with the ocean discharge guidelines. However, the detail and thoroughness of 403(c) reviews and the effectiveness of monitoring programs have varied by Region, State, and by discharge. A more effective program would include:

(1) Improvements in the "state of science" for addressing the complex issues of biological impacts and toxicity assessments in the marine environment;

(2) Nationally consistent technical guidance for addressing the ocean discharge criteria.

403(c) Implementation Strategy/Schedule: The Agency is currently developing a two-phase strategy to continue to improve the national implementation program for section 403(c). Phase one of this strategy addresses evaluation procedures for the "next round" of permits subject to 403(c) (those that expire throughout FY94). For these discharges, applicants will submit information to support a determination of no unreasonable degradation using the ten ocean discharge criteria found in the regulations. In some cases, additional data collection will be required prior to permit issuance. The Agency or authorized States will document its decision in an Ocean Discharge Criteria Evaluation. For the second phase or "subsequent permit round" starting in FY94, the Agency or authorized State will develop a more detailed ODCE based on the monitoring data collected during the previous permit period and any other available or required information. It is expected that in phase one many determinations will be based on "irreparable harm" but that by phase two the monitoring will have generated data to fill in the information gaps for assessing impacts using the ten 403(c) factors.

As part of this implementation strategy, the Agency plans a number of supporting activities to ensure effective 403(c) implementation, including development of nationally consistent technical and procedural guidance and the incorporation of new technological advances and criteria.

Findings Recommendations: Section 403(c) is a "forward looking" program emphasizing "in situ" biological analyses. However, the ability to perform complex evaluations of ocean discharge effects are limited by the "state of the science" for addressing the complex evaluation of biological impacts and toxicity assessments in the marine environment. EPA's regulations of marine discharges will emphasize sediment toxicity, aquatic toxicology, bioaccumulation, and biological integrity. EPA is developing new criteria and guidelines for biological and sediment quality and improving the scientific tools and protocols for conducting risk assessments for marine receiving waters. EPA concludes that no statutory changes are considered necessary.

The depth of 403(c) review and level of implementation varies among the Regions and the States. The Agency is planning the development of technical and procedural guidance to ensure a more consistent implementation of the 403(c) program.

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Introduction

The U.S. Environmental Protection Agency (EPA) presents this report to Congress on implementation of section 403(c) of the Clean Water Act (the Act), as required in section 1007 of the Ocean Dumping Ban Act of 1988.

Congress specifically requested the following information regarding the 403(c) program:

(1) an accounting of discharges into the waters of the territorial sea, the contiguous zone, and the ocean, including -

(A) the total number of discharges;

(B) the location, source, volume, and potential environmental effects of each discharge;

(C) the date of original issuance, review, and reissuance of each discharge permit; and

(D) the number of discharges that have been determined by the Administrator to be in compliance with the ocean discharge criteria regulations promulgated pursuant to section 403(c) of the Federal Water Pollution Control Act;

(2) a schedule for implementing section 403(c) of such Act and achieving compliance with guidelines promulgated under such section as expeditiously as practicable, and an estimate of the resources required to meet such schedule; and

(3) recommendations for any additional legislative authorities needed to achieve compliance with such guidelines.

This report addresses the above issues based on information currently available to the Agency. This report also covers the implementation of the Agency's responsibilities under the Act in carrying out the 403(c) regulatory program, including activities conducted within EPA Headquarters, Regions and the States since enactment of the Act in 1972.

Section 403(c) applies to discharges into the territorial seas, the contiguous zone, and the oceans. The determination of the boundary delineating the inland waters and the territorial seas is based on a complex set of principles developed under international law and is the responsibility of the State Department. In some instances this boundary has not been fully delineated and, consequently, it is uncertain whether some dischargers are affected by regulations under section 403(c).

In response to a letter (dated 2/8/89) from the U.S. House of Representatives' Committee on Merchant Marine and Fisheries, the Administrator responded (letter 4/14/89) that EPA would provide information on extending the requirements of section 403(c) into the Nation's estuaries. The response will identify the number and types and potential environmental effects of estuarine discharges by EPA Region, State, and waterbody, will compare point source contributions of pollutants to the total pollutant loads to these estuaries, and discuss controls that are already in place.

The 403(c) Program

EPA's regulatory program under section 403(c) is an integral part of the NPDES permit program for ocean discharges. Section 403 and its implementing regulations stress assessment of the impact of an ocean discharge on both the biological community in the area of the discharge and on surrounding biological communities.

CWA Section 403(c) Requirements

Section 403 of the CWA provides that no NPDES permit (i.e., 402 permit) for discharges to the territorial sea, contiguous zone, or oceans shall be issued unless in compliance with ocean discharge guidelines. The Agency is required to promulgate ocean discharge guidelines to be used to determine whether or not a discharge will cause degradation of marine waters. The guidelines are to include:

(A) the effect of disposal of pollutants on human health or welfare, including but not limited to plankton, fish, shellfish, wildlife, shorelines and beaches;

(B) the effect of disposal of pollutants on marine life, including the transfer, concentration, and dispersal of pollutants or their byproducts through biological, physical, and chemical processes; changes in marine ecosystem diversity, productivity, and stability; and species and community population changes;

(C) the effect of disposal of pollutants on aesthetic, recreation, and economic values;

(D) the persistence and permanence of the effects of disposal of pollutants;

(E) the effect of the disposal at varying rates, of particular volumes and concentrations of pollutants;

(F) other possible locations and methods of disposal or recycling of pollutants including land based alternatives; and

(G) the effect on alternate uses of the oceans, such as mineral exploitation and scientific study.

If insufficient information exists for any proposed discharge to make a reasonable determination on any of the guidelines, then no permit is to be issued.

Ocean Discharge Guidelines

The Ocean Discharge Criteria regulations (45 FR 65942, October 3, 1980, codified at 40 CFR Part 125, Subpart M) establish ocean discharge guidelines from which a permit writer must make a determination that a discharge will, or will not, cause "unreasonable degradation" of the marine environment.

A determination of whether or not unreasonable degradation will occur is based on consideration of the following:

(1) Quantities, composition, and potential bioaccumulation or persistence of the pollutants to be discharged;

(2) Potential transport of the pollutants by biological, physical, or chemical processes;

(3) Composition and vulnerability of potentially exposed biological communities, including

- unique species or communities,
- endangered or threatened species,
- species critical to the structure or function of the ecosystem;

(4) Importance of the receiving water area to the surrounding biological community, e.g.

- spawning sites,
- nursery/forage areas,
- migratory pathways,
- areas necessary for critical life stages/functions of an organism;

(5) The existence of special aquatic sites, including (but not limited to)

- marine sanctuaries/refuges,
- parks,
- monuments,
- national seashores,
- wilderness areas,
- coral reefs;

(6) Potential direct or indirect impacts on human health;

(7) Existing or potential recreational and commercial fishing;

(8) Any applicable requirements of an approved Coastal Zone Management Plan (CZMP);

(9) Such other factors relating to the effects of the discharge as may be appropriate;

(10) Marine water quality criteria.

"Unreasonable degradation" of the marine environment is defined in the Ocean Discharge Criteria as any of the following:

- significant adverse changes in ecosystem diversity, productivity, and stability of the biological community within the area of discharge and surrounding biological communities;
- threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms; or

- loss of esthetic, recreational, scientific or economic values which is unreasonable in relation to the benefit derived from the discharge.

EPA's section 403(c) program stresses consideration of the receiving water ecosystem, protection of unique, sensitive or ecologically critical species, and protection of human health and recreational uses. If technology-based limitations and water quality-based limitations (which are based on State water quality standards and toxicity) are met by the discharger, but it is determined that the discharge still will cause an unreasonable degradation of the marine environment, then permit writers must impose additional restrictions on the discharge, including a prohibition of discharge if necessary (e.g., seasonal, process, dispersion, or schedule of compliance requirements) to ensure that unreasonable degradation does not occur.

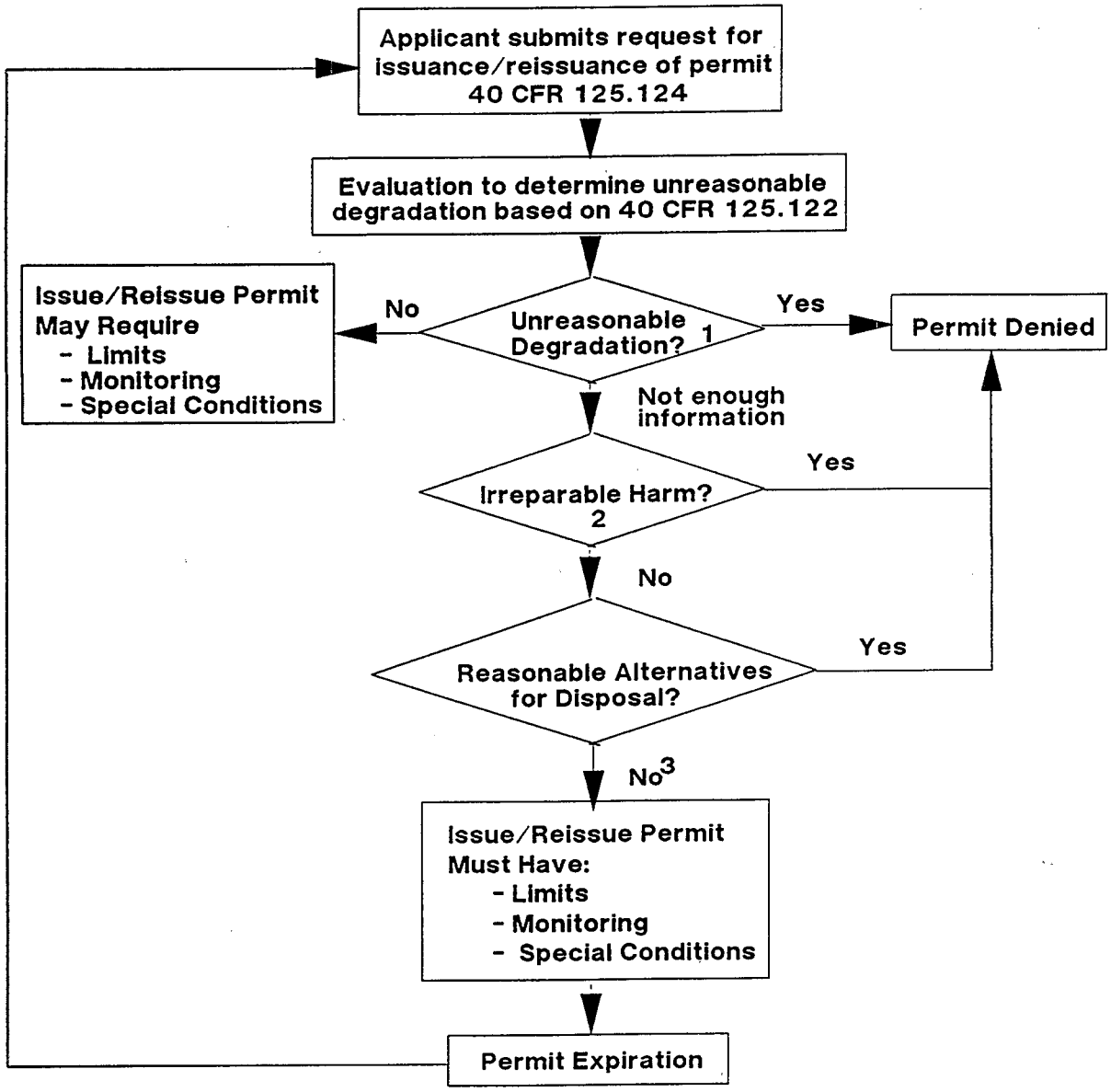
The regulations implementing section 403(c) leave considerable discretion for the permitting agency (which may be either an EPA Regional office or an authorized State) to apply discharger-specific requirements to prevent degradation of the ocean. As shown in the 403(c) decision process diagram in Figure 1, the permitting Agency first considers whether a discharge is likely to cause unreasonable degradation. If a determination *can* be made that no "unreasonable degradation" will result, a permit is issued including appropriate permit conditions to ensure that unreasonable degradation does not take place. For example, these conditions may include a requirement for an ongoing monitoring program. If the permitting Agency determines that a discharge *will* cause "unreasonable degradation" despite the application of all possible permit conditions, it may not issue a permit authorizing the discharge of pollutants.

If, because of insufficient information, a determination *cannot* be made, prior to the issuance of a permit, that no unreasonable degradation will result, then additional conditions must be satisfied, as follows:

- First, the applicant must demonstrate that the discharge will not cause "irreparable harm" to the marine environment. Irreparable harm is defined as significant impacts occurring after the date of permit issuance that will not be reversed after cessation or modification of the discharge.
- Second, the applicant must demonstrate that there are *no reasonable alternatives* to the onsite disposal of the materials to be discharged. This requirement enables EPA and the States to require an assessment of all reasonable alternatives to the discharge including land-based disposal and other discharge sites or methods.
- Third, the applicant must comply with all permit conditions established pursuant to 40 CFR 125.123(d), including effluent toxicity limits, specification of an ongoing monitoring program, and any other permit provisions based on local conditions. The permit must include a permit reopener clause.

If the discharger complies with the above additional conditions, then a discharge permit may be issued (assuming compliance with other applicable requirements). The permit must require an ongoing monitoring program to assess the impact of the discharge. If it is

Figure 1: 403(c) Decision Process



1 Unreasonable Degradation is:

(1) Significant adverse changes in ecosystem diversity,productivity and stability of the biological community within the area of discharge and surrounding biological communities.

(2) Threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms, or

(3) Loss of aesthetic, recreational, scientific, or economic values which is unreasonable in relation to benefit derived from the discharge.

2 Irreparable Harm is:

- significant undesirable effects which will not be reversed after cessation or modification of the discharge.

3 Assuming other applicable requirements are met.

determined that a particular discharge is causing unreasonable degradation to the marine environment, the discharge permit must be modified or revoked or the discharger must undertake a program to eliminate the source of the degradation.

Section 403, which was passed in the 1972 amendments, addresses the increasing stress of man's activities in the coastal and offshore zone (e.g., oil and gas operations, coastal discharges). Section 403 authorizes EPA to include habitat integrity controls, in addition to the requirements of technology-based and water quality-based permitting. The regulation of discharges from offshore oil and gas activities on the outer continental shelf is one example of the implementation of section 403(c). Several general permits, each covering hundreds of petroleum exploration and production related discharges, have been issued by the Agency based in part on an assessment of the potential for unreasonable degradation of the marine environment. This program has involved extensive field surveys of discharge characteristics, pollutant fate and transport, laboratory testing of effluent toxicity, and *in situ* biological impact assessments.

EPA has not yet developed many criteria for setting effluent limitations based on a direct relationship to *in situ* marine ambient toxicity, and biological integrity and community response. In part, this is because the protocols required to measure complex effluent toxicity, ambient toxicity, and biological community response for marine waters are being developed or are being refined. *In situ* biomonitoring methods, already in use for freshwater systems, are being modified by EPA to monitor long-term marine discharge impacts. In addition to identifying links between pollutants and biological responses in individual marine organisms, EPA's goal is ultimately to predict the consequences of specific pollutants and pollutant mixtures on the more biologically complex marine population- and community-levels.

The currently developing water quality-based approach for marine waters, which emphasizes impacts from toxics, addresses many of the same concerns as the 403(c) Ocean Discharge Criteria. Full implementation of the water quality-based approach is subject to the same limited scientific and technological capabilities for assessing ambient toxicity, bioaccumulation, and biological response and the lack of numeric criteria for these pollution indicators.

In the future, EPA's regulation of marine discharges will emphasize sediment toxicity, aquatic toxicology, bioaccumulation, and biological integrity. As technology advances for marine science, EPA will develop new criteria and guidelines for biological and sediment quality and improving the scientific tools and protocols for conducting risk assessments for marine receiving waters.

Inventory of 403(c) Ocean Discharges

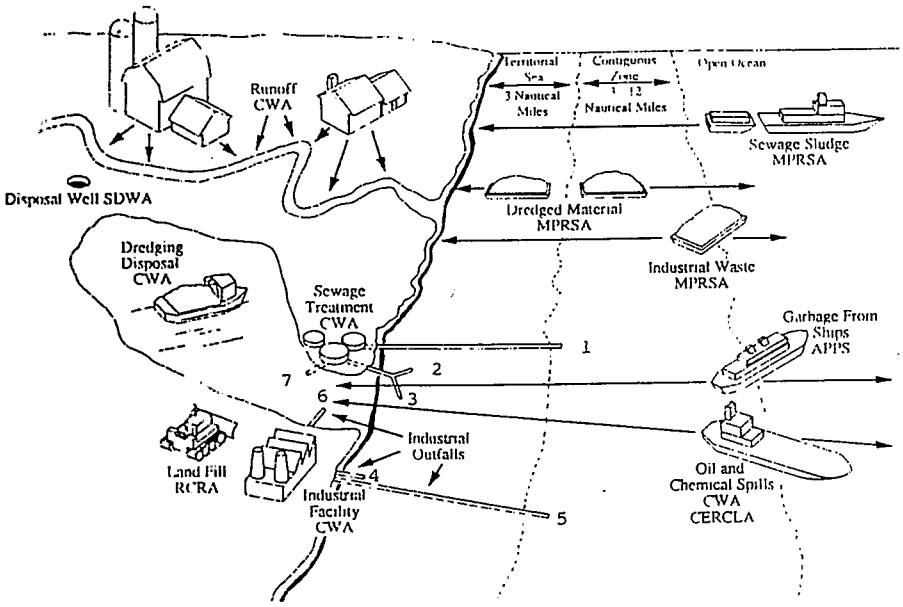
This section of the report presents summary information on the total number, location, type, and potential environmental effects of discharges currently subject to 403(c) ocean discharge criteria regulations and operating under an NPDES permit. Discharges into the ocean are permitted under *individual* or *general NPDES permits*. Individual NPDES permits normally involve one (or more) stationary outfall (pipe) discharges from a single facility. General NPDES permits may be written to regulate point sources which have the same or similar types of operations, discharge the same types of wastes, and require the same effluent limitations and the same or similar monitoring conditions (40 CFR 122.28). General permits, issued by the Agency for activities including offshore oil and gas extraction and seafood processing, may involve large geographic regions and numerous active (and inactive) stationary or mobile discharges.

To fully respond to section 1007 of the Ocean Dumping Ban Act, the Agency obtained information from a variety of sources, including EPA's Permit Compliance System (PCS), NOAA's National Coastal Pollutant Discharge Inventory (NCPDI), and permit information available directly from the Regional 403(c) coordinators. Approximately 550 permits potentially subject to 403(c) compliance have been identified. Appendix D lists the 323 individual discharge permits and Appendix E lists the 10 general discharge permits that are subject to 403(c) compliance. The status of the remaining 217 individual discharge permits, listed in Appendix F, is uncertain primarily because the "baseline" has not been clearly established for individual locations on the irregular coastline in Alaska. (Section 403(c) does not apply to discharges inside the "baseline.") The discussion throughout the remainder of this report focuses on the 323 definite 403(c) discharge permits that have been identified.

Applicability of Section 403(c) Requirements

Section 403(c) established requirements which are to be applied in determining conditions for issuing and reissuing National Pollutant Discharge Elimination System (NPDES) Permits for discharges into the territorial seas, the contiguous zone and the oceans. As illustrated in Figure 2, section 403(c) requirements apply only to point source discharges beyond the baseline, represented in the diagram with a heavy black line. A general definition of the baseline is the mean low-tide mark. When the coastline is very irregular, for example, the coasts of Maine and Alaska, the United States Department of State applies a set of rules to determine whether a discharge is, or is not, outside the baseline. In the diagram, discharges from pipes 1-5 would be subject to 403(c) requirements, but pipes 6 and 7 would not.

Figure 2. Applicability of Section 403(c) Requirements.



Total Number of Ocean Dischargers under Individual Permits

Table 1 summarizes the inventory of ocean dischargers under individual permits by EPA Region and by discharge category. Included in this analysis is the U.S., Puerto Rico, Virgin Islands, and the Pacific Islands (i.e., Guam, Republic of Palau, American Samoa, and Northern Marianas). Table 1 includes the 323 dischargers identified as subject to 403(c) compliance. These 323 dischargers are separated into the general categories of sewage treatment - 173 (53%), industrial plants discharging conventional pollutants - 32 (10%), industrial plants discharging toxic pollutants - 86 (27%), and electric utilities - 32 (10%). Of the 173 sewage treatment facilities, 35 are POTWs that have received tentative or final approval for waivers from secondary treatment under Section 301(h) of the CWA.

Total Number of Ocean Discharges Under General Permits

General permits are issued in cases where a number of like discharges with similar effluent are operating under similar discharge conditions. Of the 12 general permits listed in Appendix E, 11 involve offshore oil and gas drilling operations. The other permit covers seafood processing activities in Alaska. Table 2 summarizes the inventory of ocean

Table 1

NUMBER OF 403(c) OCEAN DISCHARGERS UNDER INDIVIDUAL PERMITS

(See also Appendix D for permit list)

EPA REGIONS	I	II	III	IV	VI	IX	X	TOTAL
Sewage Treatment								
POTWs	16(5)*	50(4)*	5	7	0	51(18)*	2(8)*	131
Private	4	7	2	7	0	2	0	22
Federal	7	4	0	0	0	9	0	20
Subtotal	27	61	7	14	0	62	2	173
Industries								
Primarily Conventional Pollutants								
Sugar Mills &Processing	0	1	0	0	0	8	0	9
Seafood Processing	5	10	0	2	0	2	0	19
Distilleries	0	4	0	0	0	0	0	4
Subtotal	5	15	0	2	0	10	0	32
Industries								
Contains Toxic Pollutants								
Lumber/Wood Products	0	0	0	0	0	1	3	4
Pulp & Paper	0	0	0	0	0	2	0	2
Petroleum Refining	0	3	0	0	0	4	0	7
Petroleum Bulk Hand.	0	0	0	0	2	15	0	17
Oil & Gas Extraction	0	0	0	0	0	3	1	4
Sulphur Extraction	0	0	0	0	12	0	0	12
Organic Chemicals	0	1	0	0	0	0	0	1
Primary Metals	0	0	0	0	0	1	0	1
Placer (Gold) Mining	0	0	0	0	0	0	2	2
Seawater Treatment	0	0	0	0	0	0	2	2
Shipbuilding	0	0	0	0	0	3	0	3
Brine Disposal	0	0	0	0	3	0	0	3
Pharmaceutical	0	2	0	0	0	0	0	2
Miscellaneous Toxics	4	10	0	0	0	11	1	26
Subtotal	4	16	0	0	17	40	9	86
Electric Utilities	2	4	0	3	0	23	0	32
Total	38	96	7	19	17	135	11	323

()* No. of POTWs that have received waivers from secondary treatment under Section 301(h)

Table 2

ESTIMATED NUMBER OF 403(c) OCEAN DISCHARGES UNDER GENERAL PERMITS

(See also Appendix E for permit list)

	Coastal and Offshore Region				
	Gulf of Mexico (EPA Regions IV and VI)	Pacific (EPA Regions IX and X)	Alaska (EPA Region X)	Atlantic (EPA Regions I, II, III, IV)	TOTAL
Oil and Gas Drilling Activities*					
Exploration Wells drilled in 1986	202	12	2	0	216
Total Exploration Wells drilled through January, 1985	6,930	400	100	36	7,466
Production Wells drilled in 1986	552	123	7	0	682
Oil and Gas Production Activities**					
Number of Platforms currently operating	4,333	36	15	0	4,384
Number of Produced Water discharges estimated in 1983	729	112	11	0	852
Seafood Processing Activities					
Number of Active Processors in 1988	0	0	290	0	290

*Note: These estimates are based on the following:

(1) 898 wells drilled in 1986 (production and exploratory) (API, 1988)

(2) 84% (754) of all wells drilled are in the Gulf of Mexico, 15% (135) are drilled in California, 1% (9) are drilled in Alaska (NAS, 1983)

(3) no wells are currently being drilled in the Atlantic

(4) exploratory wells account for about 24% of all offshore wells, although about 91% of all wells drilled in California are production wells (NAS, 1983)

**Note: These estimates are based on the following:

(1)In 1983, there were an estimated 729 produced water discharges in Federal and state waters in the Gulf of Mexico (Walk, Haydel and Associates, Inc., 1984)

(2)It is assumed that the number of produced water discharges in a region is proportional to the number of producing wells in the region.

-according to ERG (1988), 85.6% of all producing wells are located in the Gulf of Mexico, 13.2% are located in the Pacific (off California), and 1.3% are in Alaskan waters

-if there are 729 produced water discharges in the Gulf of Mexico and this represents 85.6% of all offshore discharges, then there are an estimated 852 total produced water discharges in offshore waters

-if 13.2% of all produced water discharges occur in the offshore waters of California, then there are an estimated 112 discharges in the region

-if 1.3% of all produced water discharges occur in Alaskan offshore waters, then there are an estimated 11 discharges in the region

discharges under general permits by coastal region of the United States. There are two primary types of discharge activities of interest: (1) the discharge of drilling muds and cuttings resulting from exploratory and production well development and drilling operations; and (2) the discharge of produced water resulting from oil and gas extraction methods. According to the American Petroleum Institute (API) (1988), a total of 898 production and exploratory wells were drilled in 1986. Approximately 7,466 exploratory wells have been drilled in U.S. offshore waters (Federal and State) through January of 1985 (API, 1988). As shown in Table 2, the vast majority (80%) of offshore exploratory and production wells drilled are located in the Gulf of Mexico. Comparatively, only about 6 percent and 1 percent, respectively, of offshore wells have been drilled in the Pacific region (west coast United States) and Alaskan waters. A similar pattern follows for the estimated 4,384 production platforms currently operating (99 percent of all platforms operate in the Gulf of Mexico) and the estimated 852 discharges of produced waters from producing wells operating during 1983 (86 percent in Gulf of Mexico, 13 percent in the Pacific region, and 1 percent in Alaska).

EPA Region X has issued a general permit for seafood processing facilities in Alaska. There are currently about 290 of these operations, including both intermittent mobile and permanent shore-based facilities. As many as 150 additional processors are covered under the permit which became effective in October, 1989.

Location, Source, Volume and Potential Environmental Effects

Discharges under Individual Permits

Table 3 summarizes the inventory of 403(c) dischargers under individual permits (primarily non oil and gas) indicating numbers and types of dischargers and flows by EPA Region and State/Territory. Within each EPA Region and State/Territory, sewage treatment systems have been subcategorized by type of ownership (public, private, Federal), and industrial facilities have been identified by type of pollutant and industry category. Discharge flow rates are known for most of these facilities, including all "large" facilities. *(NOTE: For purposes of this report, large POTWs are those with flow greater than or equal to 5.0 mgd. Small POTWs are those with flow less than 5.0 mgd. All other large dischargers (except electric utilities) are those with flow greater than or equal to 1.0 mgd. All other small dischargers are those with flows less than 1.0 mgd.)* For approximately 30 percent of the "small" facilities, flow information was not available. For those small facilities with unknown flow rates, default flow rates of 1.0 mgd and 0.1 mgd were specified for POTWs and industrial facilities, respectively. Figure 3 shows the approximate locations of the individually-permitted dischargers and the approximate total discharge flow by State or Territory.

Table 3

403(c) OCEAN DISCHARGES UNDER INDIVIDUAL PERMITS - BREAKDOWN BY STATE AND VOLUME OF FLOW

	Region I								Region II					
	ME		NH		MA		RI		NY		NJ		PR & VI *	
	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd
Sewage Treatment														
POTWs	9	2.2	2	2.0	4	2.0	1	0.2	2	77.0	15	159.2	33	172.8
Private	4	0.4	-	-	-	-	-	-	-	-			7	0.6
Federal	4	0.4	1	0.1	1	0.1	1	0.1	-	-			4	2.6
Subtotal	17	3.0	3	2.1	5	2.1	2	0.3	2	77.0	15	159.2	44	176.0
Industrial														
Primarily Conventional Pollutants														
Sugar Mills & Processing	-	-	-	-	-	-	-	-	-	-	-	-	1	31.4
Seafood Processing	5	0.5	-	-	-	-	-	-	-	-	-	-	10	18.1
Distilleries	-	-	-	-	-	-	-	-	-	-	-	-	4	1.6
Subtotal	5	0.5	-	-	-	-	-	-	-	-	-	-	15	51.1
Contains Toxic Pollutants														
Lumber/Wood Products	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulp & Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Refining	-	-	-	-	-	-	-	-	-	-	-	-	3	80.9
Petroleum Bulk Handling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oil/Gas Extraction	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur Extraction	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Chemicals	-	-	-	-	-	-	-	-	-	-	1	5.0	-	-
Primary Metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Placer Mining	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seawater Treatment	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shipbuilding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brine Disposal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pharmaceuticals	-	-	-	-	-	-	-	-	-	-	-	-	2	0.3
Miscellaneous Toxics	2	0.2	-	-	2	0.2	-	-	-	-	-	-	10	2.4
Subtotal	2	0.2	-	-	2	0.2	-	-	-	-	1	5.0	15	83.6
Electric Utilities	-	-	1	1200.0	1	4.1	-	-	-	-	-	-	4	1977.0
Total	24	3.7	4	1202.1	8	6.4	2	0.3	2	77	16	164.2	78	2287.7

* Note - count does not include 1 facility with unknown flow and 3 facilities with unknown SIC codes

Table 3 (Cont.)

403(c) OCEAN DISCHARGES UNDER INDIVIDUAL PERMITS - BREAKDOWN BY STATE AND VOLUME OF FLOW

	Region III						Region IV				Region VI			
	DE		MD		VA		FL		NC		TX		LA	
	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd
Sewage Treatment														
POTWs	1	6.0	2	13.0	2	37.0	7	351.5	-	-	-	-	-	-
Private	-	-	2	0.02	-	-	7	0.1	-	-	-	-	-	-
Federal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	1	6.0	4	13.0	2	37.0	14	351.6	-	-	-	-	-	-
Industrial														
Primarily Conventional Pollutants														
Sugar Mills & Processing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seafood Processing	-	-	-	-	-	-	2	0.02	-	-	-	-	-	-
Distilleries	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	2	0.02	-	-	-	-	-	-
Contains Toxic Pollutants														
Lumber/Wood Products	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulp & Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Refining	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Bulk Handling	-	-	-	-	-	-	-	-	-	-	-	-	2	3.2
Oil/Gas Extraction	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphur Extraction	-	-	-	-	-	-	-	-	-	-	-	-	12	15.3
Organic Chemicals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Primary Metals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Placer Mining	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seawater Treatment	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shipbuilding	-	-	-	-	-	-	-	-	-	-	-	-		-
Brine Disposal	-	-	-	-	-	-	-	-	-	-	2	113.5	1	25.2
Pharmaceuticals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous Toxics	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	2	113.5	15	43.7
Electric Utilities	-	-	-	-	-	-	2	2733.0	1	2000.0	-	-	-	-
Total	1	6.0	4	13.0	2	37.0	18	3084.6	1	2000.0	2	113.5	15	43.7

Table 3 (Cont.)

403(c) OCEAN DISCHARGES UNDER INDIVIDUAL PERMITS - BREAKDOWN BY STATE AND VOLUME OF FLOW

	Region IX						Region X						TOTAL ALL REGIONS	
	CA*		HI		Islands*		OR		WA		AK*			
	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd	No. Plants	Total Flow mgd
Sewage Treatment														
POTWs	30	1262.3	12	135.7	9	26.6	1	2.5	1	1.0	(8)**	-	131	2251.0
Private	-	-	1	0.2	1	0.1	-	-	-	-	-	-	22	1.4
Federal	5	0.3	2	9.5	2	3.2	-	-	-	-	-	-	20	16.3
Subtotal	35	1262.6	15	145.4	12	29.9	1	2.5	1	1.0	-	-	173	2268.7
Industrial														
Primarily Conventional Pollutants														
Sugar Mills & Processing	-	-	8	143.3	-	-	-	-	-	-	-	-	9	174.7
Seafood Processing	-	-	-	-	2	1.8	-	-	-	-	-	-	19	20.4
Distilleries	-	-	-	-	-	-	-	-	-	-	-	-	4	1.6
Subtotal	-	-	8	143.3	2	1.8	-	-	-	-	-	-	32	196.7
Contains Toxic Pollutants														
Lumber/Wood Products	1	1.0	-	-	-	-	3	20.4	-	-	-	-	4	21.4
Pulp & Paper	2	34.8	-	-	-	-	-	-	-	-	-	-	2	34.8
Petroleum Refining	2	6.9	2	5.4	-	-	-	-	-	-	-	-	7	93.2
Petroleum Bulk Handling	-	-	8	0.6	7	0.2	-	-	-	-	-	-	17	4.0
Oil/Gas Extraction	3	1.5	-	-	-	-	-	-	-	-	1	1.3	4	2.8
Sulphur Extraction	-	-	-	-	-	-	-	-	-	-	-	-	12	15.3
Organic Checmials	-	-	-	-	-	-	-	-	-	-	-	-	1	5.0
Primary Metals	1	0.1	-	-	-	-	-	-	-	-	-	-	1	0.1
Placer Mining	-	-	-	-	-	-	-	-	-	-	2	47.8	2	47.8
Seawater Treatment	-	-	-	-	-	-	-	-	-	-	2	10.7	2	10.7
Shipbuilding	1	0.003	1	0.1	1	0.1	-	-	-	-	-	-	3	0.2
Brine Disposal	-	-	-	-	-	-	-	-	-	-	-	-	3	138.7
Pharmaceuticals	-	-	-	-	-	-	-	-	-	-	-	-	2	0.3
Miscellaneous Toxics	-	-	7	1.1	4	0.9	-	-	-	-	1	0.0	26	4.8
Subtotal	10	44.3	18	7.2	12	1.2	3	20.4	-	-	6	59.8	86	379.0
Electric Utilities	17	7018.0	3	961.8	3	454.0	-	-	-	-	-	-	32	16347.8
Total	62	8324.5	44	1257.7	29	486.9	4	22.9	1	1.0	6	59.8	323	19192.7

* Note: count does not include 3 facilities with unknown flow or SIC code (1 in Alaska, 1 in Islands, 1 in California)

** Plants with 301(h) waivers

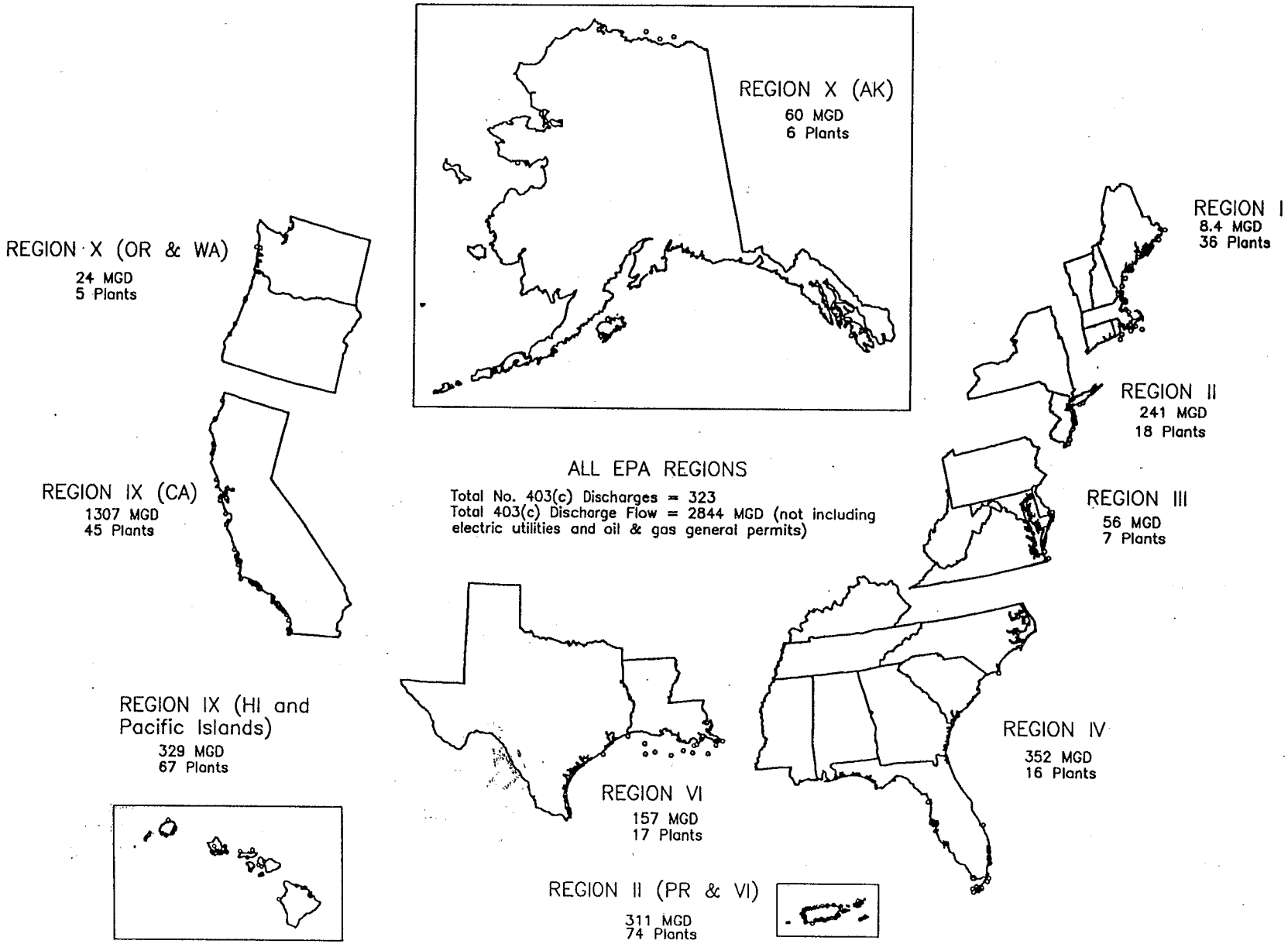


Figure 3. National Summary of 403(c) Discharges Under Indivdual Permits
(Not including electric ulitites, offshore oil and gas, and seafood processors under general permits)

Based on flow (excluding electric utilities and offshore oil and gas), sewage treatment plants account for approximately 80 percent of the total waste volume of direct discharges to the ocean. Industrial discharges contribute the remaining 20 percent. Nationally, the total combined waste volume from direct ocean discharges (excluding electric utilities and offshore oil and gas) exceeds 2.8 billion gallons per day. Figure 4 shows that 58 percent of this volume is discharged by facilities in EPA Region IX (CA, HA, Pacific Islands). About 19 percent is discharged by facilities in Region II (New Jersey, New York, Puerto Rico, and Virgin Islands) and 12 percent in Region IV (NC, SC, GA, FL, AL, MS), while the remaining 11 percent comes from discharges in Regions I, III, VI, and X.

Analyses based on flow alone, however, do not necessarily provide an accurate indication of the contribution of the different types of 403(c) ocean discharges to environmental impacts. There are other factors which may determine ultimate impact (i.e., pollutant types, water depth, current speed, proximity to sensitive ecological zones). Except for pollutant type, most of these factors are site and pipe-specific, and while analyzed in detail during the permit application and review process, have not been included in the present inventory. However, the effluent pollutant characteristics are probably the most telling factor in estimating relative impact potential. An industrial plant discharging a small amount of highly persistent and/or bioaccumulative toxic pollutants may cause a more severe or irreversible effect on resident biota and human health than a larger sewage treatment plant discharging only conventional pollutants.

Table 4 summarizes and compares the major characteristics of the ocean discharge categories based on pollutant types and primary concerns for environmental effects. General definitions and comments on the pollutant types listed in Table 4 are given in Table 5 (reprinted from NOAA; 1987). To further aid in understanding the potential environmental effects of the 403(c) discharges, Fact Sheets have been prepared on several discharge categories, listed in Table 4, including:

- POTWs
- Offshore Oil and Gas Facilities
- Alaskan Seafood Processors
- Offshore Placer Gold Mining
- Log Transfer Facilities
- Seawater Treatment Plants
- Cane Sugar Mills
- Petroleum Refineries
- Pulp and Paper Mills
- Sawmills

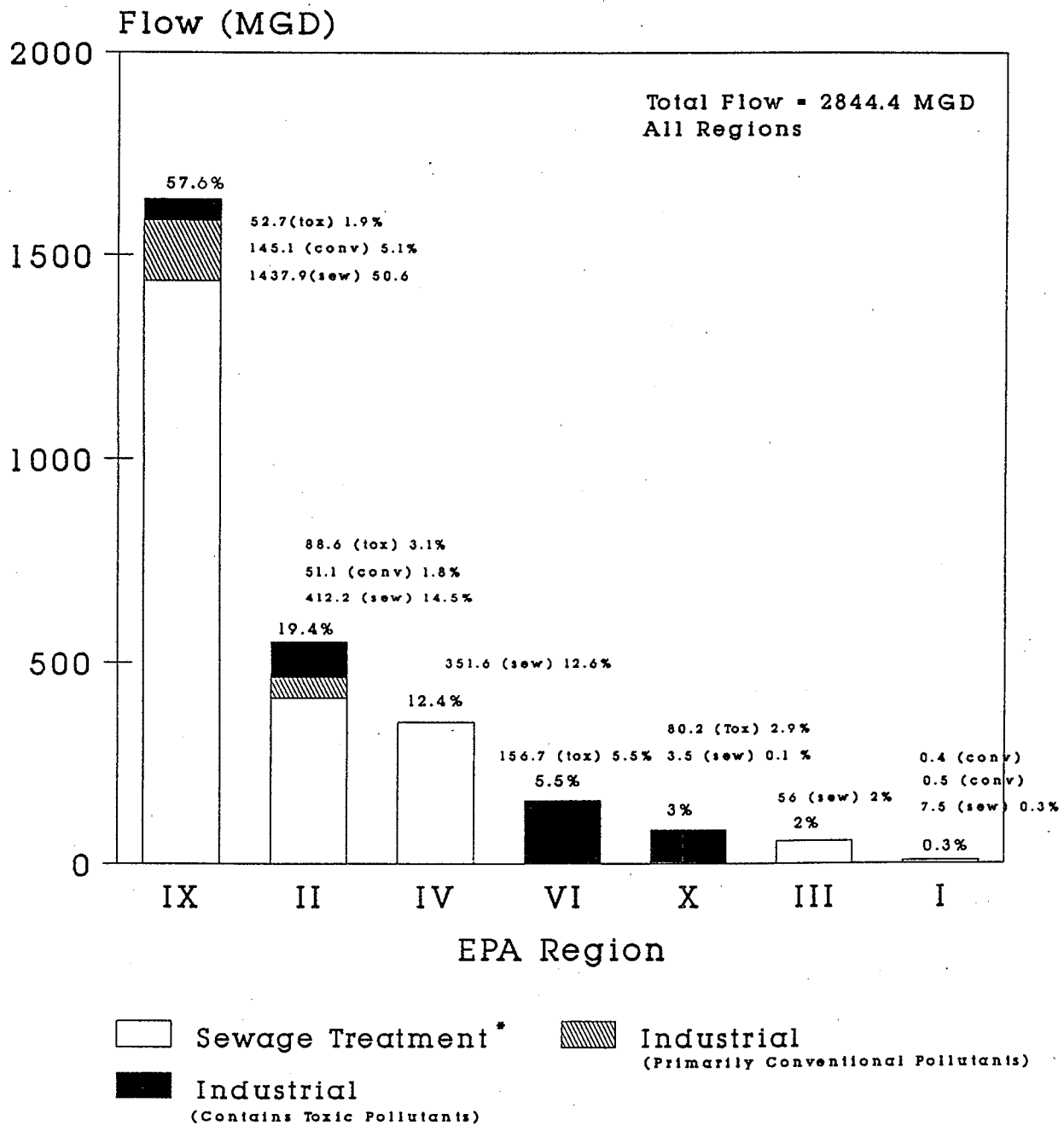
These Fact Sheets are presented in Appendix C.

For purposes of this discussion, individually-permitted ocean dischargers are categorized into four primary groups: (1) POTWs (and other sewage treatment systems); (2) industrial facilities discharging

Figure 4

OCEAN DISCHARGES BY FLOW AND EPA REGION

(excluding electric utilities and offshore oil and gas)



* Note - many Publicly Owned Treatment Works (POTWs) contain toxic as well as conventional pollutants

Table 4
TYPICAL POLLUTANTS AND POTENTIAL ENVIRONMENTAL EFFECTS FOR OCEAN DISCHARGES UNDER INDIVIDUAL PERMITS

Discharge Category	No. of Disch's (total flow, mgd)	Typical Pollutants[1] (mg/l)									Primary Concerns to Receiving Water Environment
		Conventional					Toxic				
		BOD5	TSS	TN	TP	FCB	Metals	Pet HCs	PCBs	CHP	
POTWs ☑											Large POTWs can impact large areas of receiving waters. Typical concerns include nutrient enrichment, increased suspended solids, creation of organically enriched sediments, accumulations of toxics bound to sediments and resultant impacts on benthic infauna and demersal fishes through population alteration, bioaccumulation of toxics, disease, and interference in trophic structure.
avg. all flows	173 (2268.7)	79.0	53.0	13.5	9.8	ND	0.14	14.1	ND	1.34	
Industrial Conventional Pollutants											These industries discharge pollutants similar to POTWs, but at typically higher concentrations of solids and organic matter but with typically lower or no toxic pollutants. Impacts primarily consist of localized increases in suspended solids, organic enrichment of sediments, smothering of the bottom, reduced light transmittance, reduced dissolved oxygen and resultant stress to benthic infauna and fish populations.
Cane Sugar Mills and Processing ☑	9 (174.7)	57.0	180.3	-	-	-	-	-	-	-	
Seafood Processors ☑	19 (20.4) 290 (0.1)*	417.4	213.1	22.6	-	-	-	-	-	-	
Distilleries	4 (1.6)	219.6	34.2	16.8	-	-	-	-	-	-	
Industrial Toxic Pollutants											These industries discharge a variety of both conventional, toxic, and non-conventional pollutants. Certain toxics tend to persist and accumulate in bottom sediments resulting in potential alteration of the biological community, bioaccumulation, disease, and interference in trophic structure.
Lumber/Wood Products ☑	4 (21.4)	38.7	31.8	-	-	-	1.64	9.8	-	-	
Pulp & Paper ☑	2 (34.8)	17.3	28.4	1.4	-	-	0.25	-	-	-	
Petroleum Refining ☑	7 (93.2)	13.5	26.1	6.8	-	-	0.22	17.1	-	-	
Petroleum Bulk Handling	17 (4.0)	30.0	30.0	-	-	-	-	10.0	-	-	
Oil/Gas Extraction ☑	4 (2.8)	◀ see Table 5 ▶									
Sulphur Extraction	12 (15.3)	ND	ND	ND	ND	ND	ND	ND	-	-	
Organic Chemicals	1 (5.0)	23.6	47.7	33.4	-	-	0.46	15.5	-	-	
Primary Metals	1 (0.1)	-	34.4	-	-	-	20.43	34.6	-	-	
Placer Mining ☑	2 (47.8)	-	ND	-	-	-	ND	-	-	-	
Seawater Treatment ☑	2 (10.7)	-	77.0	-	-	-	-	-	-	0.15**	
Shipbuilding	3 (0.2)	-	26.7	-	-	-	5.92	2.2	-	-	
Brine Disposal	3 (138.7)	-	35.0	-	-	-	-	10.0	-	-	
Pharmaceuticals	2 (0.3)	83.0	108.0	-	-	-	0.5	-	-	-	
Electric Utilities											Primary concerns are related to physical impingement of fish passing through cooling systems, elevated temperatures in the "nearfield," and residual chlorine effects.
recycled cooling	32(16347.9)	-	30.0	-	-	-	0.75	-	-	**	
once through cooling		-	-	-	-	-	0.002	-	-	**	

1 Refer to Table 5 for pollutant definitions and general effects

☑ See Fact Sheet for Description of Discharge Characteristics (Appendix C)

* For estimation purposes, the average flow rate of each of the 290 seafood processors under general permit in Alaska is assumed to equal 0.1 mgd.

** Disinfection using chlorine may produce chlorinated reaction products which may bioaccumulate in marine organisms.

Table 5
Pollutants included in NOAA's National Coastal Pollutant Discharge Inventory (NCPDI)[1]

Pollutants	Definition	Effects
1.OXYGEN-DEMANDING MATERIALS Biochemical Oxygen Demand (BOD5)	Measure of organic material in a discharge that can be readily oxidized through microbial decomposition.	Can result in depletion of dissolved oxygen concentrations; low concentrations can result in death of marine organisms.
2.PARTICULATE MATTER Total Suspended Solids	Measure of suspended solid material.	Increase turbidity and bottom deposition; many toxic compounds are bound to, carried by, and deposited with TSS particles.
3.NUTRIENTS a.Total Nitrogen (TN)	Measure of all forms of nitrogen, i.e., nitrate, nitrite, ammonia-N, and organic forms.	N & P are major plant nutrients. Excessive amounts in water overstimulate plant growth, resultant oxygen depletion may have lethal effects on marine organisms.
b.Total Phosphorus (TP)	Measure of all forms of phosphorus, i.e., ortho and para-compounds.	
4.HEAVY METALS a.Arsenic (As) b.Cadmium (Cd) c.Chromium (Cr) d.Copper (Cu) e.Iron (Fe) f.Lead (Pb) g.Mercury (Hg) h.Zinc (Zn)	A group of elements present in the environment from natural and anthropogenic sources that can produce toxic effects; determiniation based on EPA standard methods that measure environmentally available "metals."	Can be toxic to marine organisms, and potentially to humans, through consumption of contaminated water and organisms.
5.PETROLEUM HYDROCARBONS (Pet HCs)	A mixture of hydrocarbons found in petroleum comprised of hundreds of chemical compounds.	Acute lethal and chronic sublethal toxicity to marine organisms; interference with cellular and physiological processes, e.g., feeding and reproduction.
6.CHLORINATED HYDROCARBONS a.Polychlorinated Biphenyls (PCBs)	A group of aromatic compounds composed of two fused benzene rings and two or more chlorine atoms; used in heat exchange and insulating fluids.	Toxic to marine organisms, highly persistent; potential human carcinogen through consumption of contaminated water and organisms.
b.Chlorinated Hydrocarbons other than PCBs (CHP)	Includes the chlorinated pesticides, aromatic, and nonaromatics.	Varying degree of acute and chronic aquatic toxicity, persistence, and human carcinogenicity.
7.PATHOGENS Fecal coliform bacteria (FCB)	Enteric bacteria which enter water in fecal material of human or animal origin; FCB are used as an indicator of the presence of pathogens.	Main effects are on public health quality and safety of seafood.

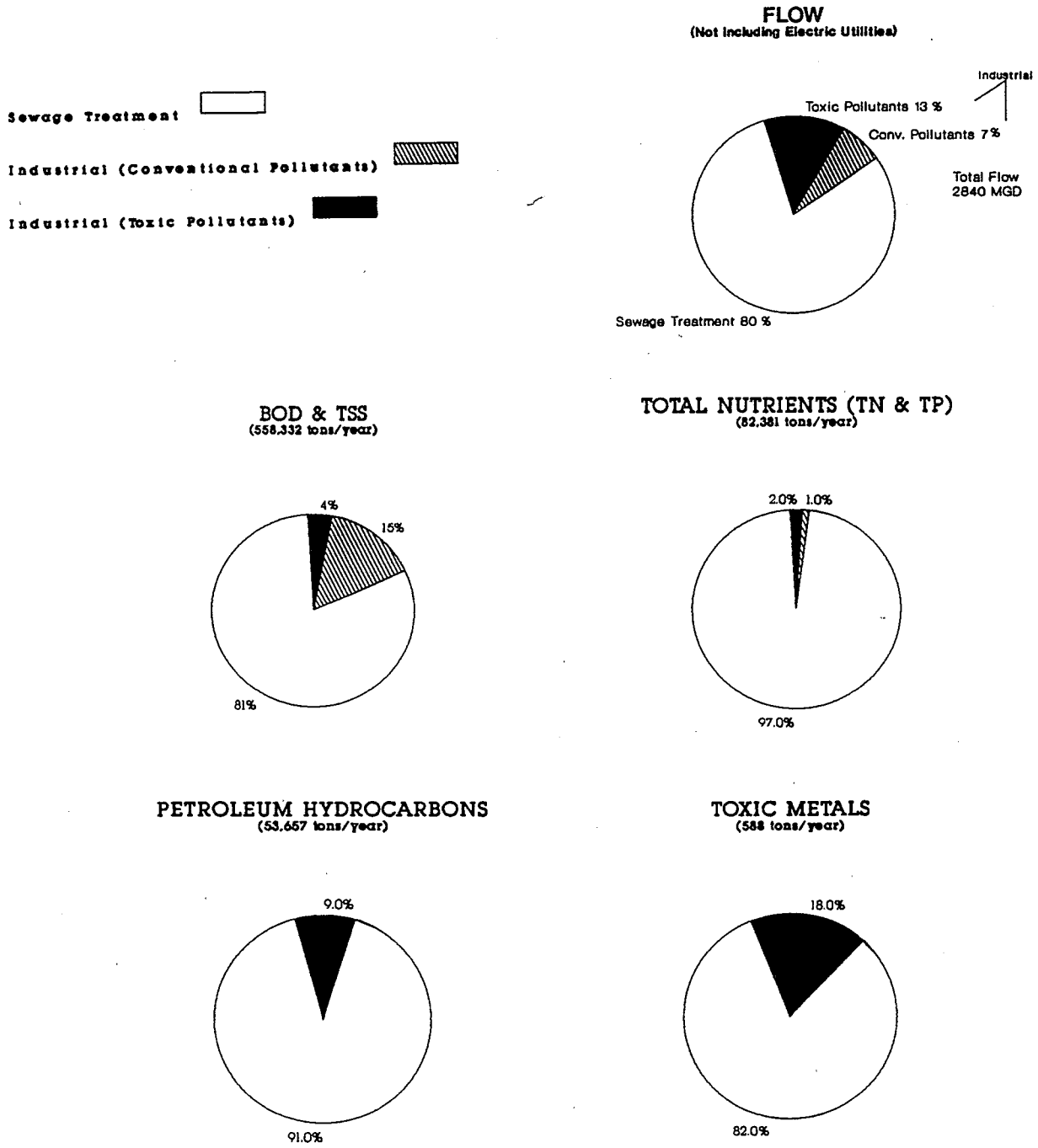
[1] Reprinted from NOAA, 1987. The National Coastal Pollutant Discharge Inventory. Pollutant Discharge Concentrations for Industrial Point Sources.

conventional pollutants; (3) industrial facilities discharging effluent containing conventional and toxic pollutants; and (4) electric utilities (cooling systems). This grouping facilitates a comparison of the total pollutant loading by primary discharge categories, as shown in Figure 5. Sewage treatment plants account for the vast majority of both conventional and toxic pollutants discharged to 403(c) waters on the National scale. However, even though the category of industries discharging toxic pollutants accounts for only about 13 percent of total flow, these industries are estimated to contribute a greater relative proportion of toxic metals (18 percent), while contributing a lesser proportion of petroleum hydrocarbons (9 percent). In particular, of the 18 percent contribution of total toxic metals, approximately 9 percent is estimated to come from the lumber and wood products industries.

POTWs appear to represent nationwide the greatest overall environmental impact to ocean waters for land-based 403(c) facilities. This is especially the case for those POTWs which have high flows and/or high proportions of industrial influent with associated toxic pollutants. The volume of industrial influent to POTWs is a concern because POTWs were originally designed primarily to remove the conventional pollutants (BOD and TSS), and not the toxic and non-conventional contaminants from industrial sources. Also of special interest are those industries which locally or regionally tend to discharge proportionately higher levels of toxics (e.g., pulp and paper, petroleum refining, chemicals, mining, wood products).

Industrial wastewater discharges to POTWs are regulated under provisions of the General Pretreatment Regulations (40 CFR Part 403) and National Categorical Pretreatment Standards (40 CFR Parts 405-471). The General Pretreatment Regulations establish prohibited discharge standards (e.g., no discharges that are flammable, explosive, corrosive, obstruct flow, or upset POTW processes), and require certain POTWs to develop pollutant-specific local limits to implement the prohibitions. Local limits apply to affected industrial dischargers in the POTW's service area. Among the POTWs that must develop local limits, are those that are also required to develop local pretreatment programs. In other words, those POTWs that meet one of the following criteria: (1) have a design flow greater than five million gallons per day (mgd) or (2) have a design flow less than 5 mgd but receive nondomestic (e.g., industrial) wastes that cause treatment plant upsets, contaminate sludge, or violate NPDES permit limits. Recently, EPA proposed (53 FR 47632, November 23, 1988) amendments to the General Pretreatment and NPDES regulations to provide more effective controls on the discharge of hazardous wastes discharged to POTWs. National Categorical Pretreatment Standards are EPA-developed, industry specific standards that reflect the amount of pollutant reduction that is both technologically available, and economically achievable. The standards are applicable to all facilities within a regulated industry.

Figure 5. COMPARISON OF OCEAN DISCHARGE CATEGORIES BY POLLUTANT LOADINGS



Discharges under General Permits (Offshore Oil and Gas)

Table 6 summarizes the estimated discharge volumes from offshore oil and gas activities by coastal region. Figure 6 shows the approximate locations of the general permit areas (see Appendix E for list of permits). Estimates in Table 6 are presented for both drilling operations, which primarily discharge drilling muds and cuttings, and for production operations, which discharge primarily produced water. As shown in this table, approximately 85-90 percent of discharge volume from oil and gas activities occurs in the Gulf of Mexico. Table 7 summarizes the major characteristics of effluents from oil and gas discharges based on pollutant types, typical concentrations, and primary effects on the marine receiving water environment. To further aid in understanding the potential environmental effects from offshore oil and gas discharges, a Fact Sheet has been prepared which summarizes effluent characteristics and behavior and fate of the effluent in receiving waters, and describes the primary potential impacts. This Fact Sheet is presented in Appendix C.

Table 6
ESTIMATED VOLUME OF DISCHARGES FROM OFFSHORE OIL AND GAS ACTIVITIES

Coastal Region	Drilling Activities				Production Activities	
	Estimated No. of Wells in 1986[1]		Estimated Yearly Discharge (bbl)[2]		Estimated No. of Produced Water Discharges[1]	Estimated Discharge Rate (bbl/day)[3]
	Exploration	Production	Muds	Cuttings		
Gulf of Mexico	202	552	5,178,836	1,177,202	729	6,981,633
Pacific	12	123	927,285	110,766	112	1,072,624
Alaska	2	7	61,896	14,139	11	105,347
Atlantic	0	0	0	0	0	0
Total	216	682	6,168,017	1,302,107	852	8,159,604

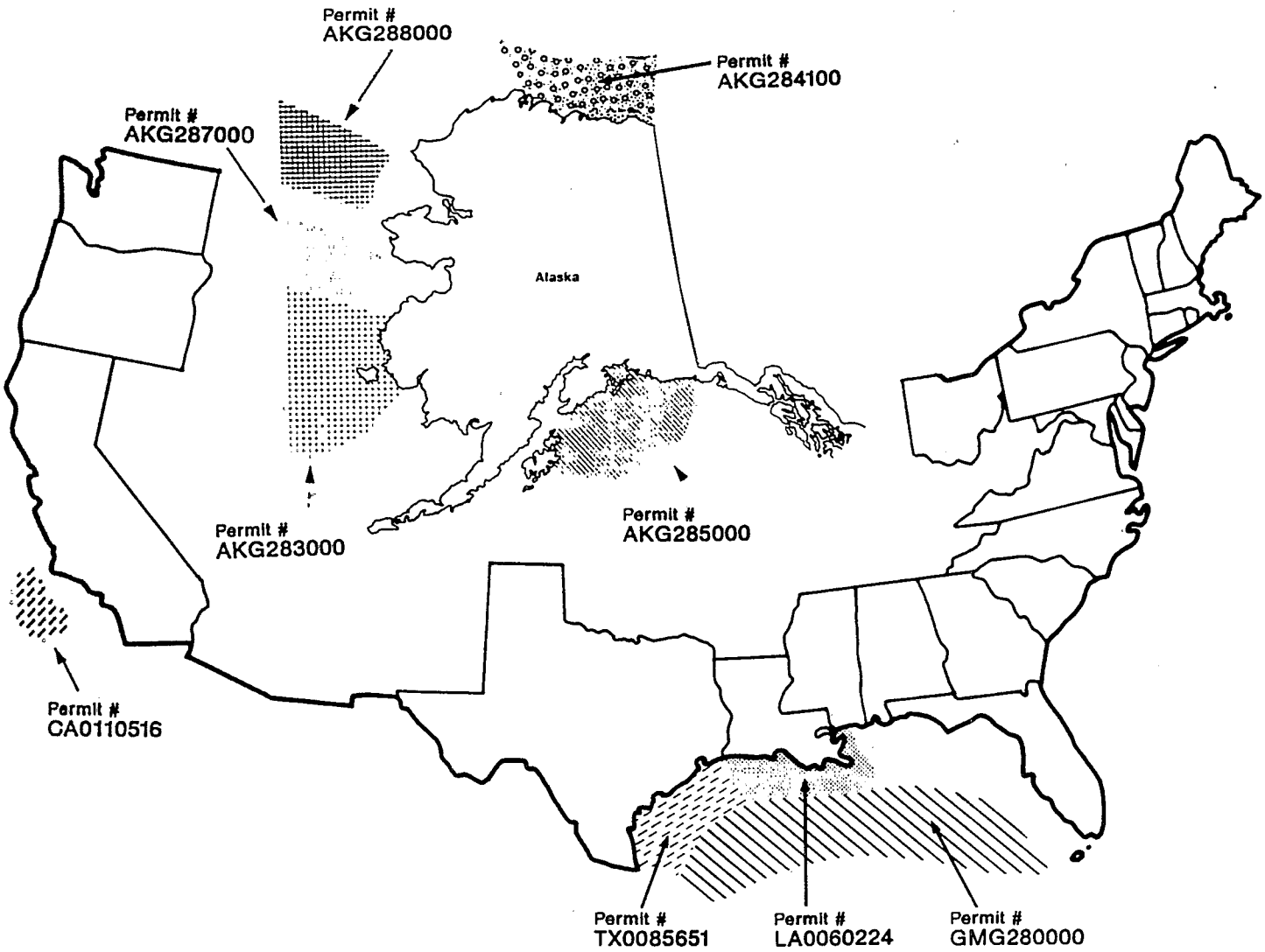
1 Note: See Table 2 for explanation

2 Note: These estimates are based on the following:

- typical well is drilled to 10,000 ft and discharges 6,749 bbl of drilling fluid and 1,430 bbl of cuttings (EPA, 1988a; 1988b)
- 31% of all wells are drilled to 14,000 ft and discharge an additional 385 bbl of drilling fluid and 423 bbl of cuttings (EPA, 1988a; 1988b)

3 Note: These estimates are based on the following:

- Discharge rates vary widely from one site to the next. The amountof produced water generated from a well can range from zero to as much as 98% of the total fluid produced (Burns and Roe, 1980). The average discharge estimates of 9,577 bbl/day from the EPA verification 30 platform study (EPA, 1982a) are used here to estimate the total discharge volume for each of the regions.



NPDES Offshore Oil and Gas General Permit Areas

Figure 6.

Table 7
Typical Pollutants and Potential Environmental Effects from Oil and Gas Discharges*

	Drilling Fluids	Produced Water	Effects
METALS	(mg/l)	(mg/l)	Metals represent a pollutant of concern because of their potential accumulation. Certain metals concentrate in surface sediments around platforms. The enrichment of metals around platforms is distance dependent, with maximum enrichment factors seldom exceeding ten. In metal accumulation studies maximum enrichment factors were generally less than 10 with the exception of barium and chromium, 300 and 36, respectively. Depuration studies of Ba, Cr, Pb, and Sr showed 40-90% decreases of excess metal in tissues after removal from the contamination. Most of these studies are with whole muds or mud aqueous fractions and, therefore, may be over or underestimations of potential accumulation.
Antimony	3.59	----	
Arsenic	12.8	.071	
Barium	----	----	
Beryllium	32.3	----	
Cadmium	3.31	.003	
Chromium	408	.218	
Copper	99.4	.065	
Lead	55.7	.103	
Mercury	.487	.0035	
Nickel	11.5	.013	
Selenium	.542	.243	
Strontium	.564	----	
Silver	322	.027	
Thallium	.313	----	
Zinc	204	1.31	
ORGANICS	(ug/l)	(mg/l)	Drilling fluids and produced water impacts are mainly due to the presence of hydrocarbons. Chronic exposure occurs in areas where the hydrocarbons are not rapidly removed from the system and where there is continuous input. Benthic communities are likely to be subject to chronic exposure as hydrocarbons become associated with the sediments. Organic pollutants eventually impact the benthos even if the plume does not impact the bottom directly. These chemical constituents adsorb to suspended matter and settle to the bottom. It has been noted that components at very low concentrations in produced water, especially substituted naphthalenes, can accumulate to high concentrations in sediments and in biota.
Acenaphthene	----	.0003	
Alkybenzenes	27,100	----	
Alkyfluorene	149,400	----	
Alkylnaphthalenes	124,100	----	
Alkyphenanthrene	18,850	----	
Alkylphenol	146.1	----	
Benzene	154.8	2.39	
Cyanides	----	.01	
Ethylbenzene	3,073	.433	
Fluorene	12,790	----	
Naphthalene	23,449	.177	
Pentachlorophenol	----	.022	
Phenanthrene	30,350	----	
Phenol	16,560	2.17	
Phosphorus	----	.735	
PAHs	368,900	.482	
Toluene	----	1.97	
Total Biphenyls	245.9	----	
Total Dibenzothiophenes	10,210	----	
CONVENTIONALS			Hypersalinity and low or no DO are common characteristics of produced water. Anoxic or hypersaline conditions can cause mortality in benthic communities. The duration, volume, and dispersion of the plume determines the extent of the effects. BOD and COD are dependent on the type of mud used and whether or not oil was added.
BOD	21 - 9,553 mg/kg**	300 - 2,000 mg/l	
COD	420 - 98,300 mg/kg**	100 - 3,000 mg/l	
TSS	37 - 498 lb/bbl	-------	

* From the 30 Platform Study

** Range covers from spud mud with no oil to generic mud #8 with 5% oil.

403(c) Program Status by Region

This section of the report presents the current implementation status of section 403(c) by EPA Region and State. The Regional summaries include a discussion of the primary discharges of concern, their compliance status with regard to the ocean discharge criteria pursuant to section 403(c), and a discussion of States' role in the permit program.

General Status

The dates of original issuance, reissuance, and expiration of each NPDES permit are listed in Appendix D for dischargers under individual permits and in Appendix E for dischargers under general permits. Table 8 summarizes the overall schedule status for permit reissuance, based on information presently available. The number of expiring permits is presented by year and by type of discharge. Dischargers are classified according to size (flow) and type (POTW, industrial discharging conventional pollutants, industrial discharging toxic and nonconventional pollutants) to facilitate estimation of resource requirements for permit reviews as subsequently presented in this report. All NPDES permits are based on a 5 year cycle. Although permits may be reopened and modified, if necessary, during the 5 year period, in practice very few are reopened.

Implementation of the 403(c) ocean discharge criteria is the responsibility of EPA Regional and State (when NPDES authorized - see Table 9) permit writers under the NPDES program. *(Note: NPDES authorized states do not have authority beyond the territorial sea.)* Permit writers generally rely on available information to perform the necessary evaluations to make a determination as to whether a discharge would result in "unreasonable degradation". In general, highest priorities for compliance reviews have been set for establishing (1) general permits which regulate a large number of similar activities (e.g., offshore oil and gas, mobile seafood processors) and (2) major discharges and discharges in or near known ecologically sensitive zones (e.g., coral reefs, marine sanctuaries, etc.). As a result of the rapidly evolving nature of the permits program for marine waters and the limited availability of resources at the local and Regional levels, the detail of 403(c) reviews, the effectiveness of monitoring programs, and the level of review performed after permit issuance has varied by Region, by State, and by discharge. Most of the "large" land-based ocean discharges subject to 403(c) reviews are in compliance with the ocean discharge criteria, according to reports from the Regional EPA 403(c) coordinators. In these cases, the permittee, the State, and/or the Regional EPA office performed, or are performing, studies with relatively extensive data collection and analyses. Examples include the Miami-area POTWs (Region IV), the salt brine discharges of the Strategic Petroleum Reserve in Texas and Louisiana (Region VI), the LA-Hyperion POTW in Southern California (Region IX), seawater treatment plants, and offshore mining activities in Region X. In other Regions that show a need for improvement and/or are behind schedule

Table 8

DISTRIBUTION OF NPDES PERMIT RENEWALS SUBJECT TO 403(c) BY DISCHARGE CLASSIFICATION

DISCHARGE CLASSIFICATION	EXPIRED	Number of Expiring Permits 1989	1990	1991	1992	1993	TOTAL
1. Large POTW (>50 mgd)	3	0	4	0	2	1	10
2. POTW (5-50 mgd)	5	7	12	4	3	6	37
3. Small POTW/Private or Federal Facility (<5mgd)	47	21	25	13	9	13	128
4. Large Industrial (>5 mgd, includes priority pollutants and/or other toxics)	2	5	1	3	1	0	12
5. Industrial (0.5-5 mgd, includes priority pollutants and/or other toxics)	1	3	3	3	1	11	22
6. Small Industrial (<0.5 mgd, includes priority pollutants and/or other toxics)	9	13	5	7	1	0	35
7. Large Industrial (>5 mgd, conventional pollutants only)	1	0	2	1	0	0	4
8. Industrial (0.5-5 mgd, conventional pollutants only)	3	0	1	3	3	0	10
9. Small Industrial (<0.5 mgd, conventional pollutants only)	3	0	1	2	0	0	6
10. Electric Utilities	4	11	7	1	4	4	31
Subtotal	78	60	61	37	24	35	295
11. General Permits							
Oil and Gas	0	2	1	2	0	4	9
Non Oil and Gas	0	1	0	0	0	0	1
Total	78	63	62	39	24	39	305

NOTE: Totals do not include facilities which are missing permit expiration date due to lack of information or because permits have not yet been issued for these facilities.

Table 9

STATUS OF NPDES PROGRAM AUTHORITY IN COASTAL STATES

Region	Approved State NPDES Permit Program	NPDES Permit Program Not Authorized
I	Rhode Island Connecticut	Maine New Hampshire Massachusetts
II	New York New Jersey Virgin Islands*	Puerto Rico
III	Delaware Maryland Virginia	--
IV	North Carolina South Carolina Georgia Alabama Mississippi	Florida
VI	--	Texas Louisiana
IX	California Hawaii	Palau Guam, American Samoa, Northern Marianas
X	Oregon Washington	Alaska

* The status of the Virgin Islands is expected to change to the "Not Authorized "category within the next few years.

in compliance reviews, the Agency is working to achieve more efficient implementation procedures and plans to accelerate 403(c) reviews consistent with available resources and priorities. Recommendations for enabling the Regions and States to more fully implement the program are presented later in this report.

Region I

Region I includes the coastal States of Maine, New Hampshire, Massachusetts, and Rhode Island (see Figure 7). The coastline of Connecticut lies entirely inside the baseline, and thus is not subject to 403(c) requirements. Of these States, only Rhode Island is authorized to administer the NPDES permits program. Most of the 38 ocean discharges in Region I are small public or private sewage treatment facilities serving small coastal towns. Of these, 17 are in Maine, 3 in New Hampshire, 5 in Massachusetts, and 2 in Rhode Island. Five of the Maine discharges are small seafood processing operations. Small discharges of conventional pollutants to ocean waters such as the above are not generally expected to cause unreasonable degradation.

The North Atlantic area of Region I is complex not only in its circulation patterns but also in the interrelated manner in which a wide array of species inhabit the extremely productive waters of the region. The coastline of Maine, New Hampshire and northern Massachusetts is composed predominantly of rocky headlands. These exposed rocky shores support a dense and diverse assemblage of benthic invertebrates with some species densities ranging up to 160,000/m^2. The lower coastline in the North Atlantic is comprised more of moderately populated, medium grain sandy beaches and densely populated muddy fine sand/silt wetlands. Near coastal (ocean) water quality appears to be generally good and shows limited evidence of pollution. Except for coastal disposal of dredged materials, which results in temporary degradation of local water quality, no other materials are presently being dumped in the area. The area provides abundant commercial and recreational fishing resources.

The unique topography and hydrography of Georges Bank make it one of the most productive regions per unit of area of any oceanic shelf region. This area is characterized by vigorous tidal circulation and turbulence which prevent stratification that might restrict the upward flow of nutrients to the surface. Productivity is consistently high and environmental conditions exist which sustain a high biomass of commercially important finfish and shellfish. Not unlike the remainder of the North Atlantic, water quality in the Georges Bank area shows only very limited effects of man-made inputs.

Currently there is no oil and gas activity in the Atlantic Ocean. Individual drilling and exploration permits were issued under BPT limitations off of Regions I and II in 1980. Exploratory wells were drilled, but never put into production.

Under 403(c) Region I has begun to assess the potential degradation effect of salmon net pens. These net pens are approximately 90 feet in diameter and are used to farm commercial salmon. The effects that

REGION 1		Flow (MGD)
Sewage Treatment Plants		
MA0005916	WOODS HOLE OCEANOGRAPHIC INST.	0.100
MA0090182	NAT. MARINE FISHERIES AQUARIUM	0.100
MA0090654	USCG LS CAPE ANN STP	0.100
MA0100081	GOSNOLD STP	1.000
MA0100145	ROCKPORT STP	0.450
MA0101605	DARTMOUTH STP	0.400
MA0101737	MARSHFIELD STP	0.120
ME0000388	MCGUNDY FISH CO.	0.024
ME0020826	CLIFF HOUSE AND HOTEL	0.100
ME0021229	PINE TREE CONSERVATION SOCIETY	0.100
ME0021563	ISLAND RETREAT ASSOCIATION	0.100
ME0090034	ACADIA NATIONAL PARK STP	0.100
ME0090051	NAVAL SECURITY GROUP STP	0.100
ME0090328	USCG LS BASS HARBOR STP	0.100
ME0090417	USCG LS W. QUADDY HEAD STP	0.100
ME0100200	EASTPORT CITY	0.479
ME0100790	WELLS STP	0.000
ME0100986	OGUNQUIT SEWER DISTRICT	0.000
ME0101052	JONESPORT TOWN STP	0.100
ME0101338	MOUNT DESERT (OTTER CREEK)	0.000
ME0101354	MT. DESERT-SEAL HARBOR STP	0.170
ME0101770	MSAD #8-LINCOLN SCHOOL WTP	0.100
ME0101851	STONINGTON STP	0.479
ME0102016	LUBEC, LOWN OF	1.000
ME0102148	EASTPORT (QUODDY VILLAGE)	0.100
ME0102172	KENNEBUNKPORT, TOWN OF	0.012
NH0020966	WALLIS SANDS ST. PARK STP	0.100
NH0101184	RYE STP	1.000
NH0101303	SEABROOK STP	1.000
RI0090131	USCG STA PT. JUDITH STP	0.100
RI0100196	NEW SHOREHAM STP	0.190
Industrial (Conventional Pollutants)		
ME0000523	A.J. PEACOCK CANNING CO.	0.080
ME0022608	STINSON CANNING	0.061
ME0000795	STONINGTON CANNING	0.270
ME0022632	QUADDY PACKING COMPANY	0.016
Industrial (Toxic Pollutants)		
ME0022951	MAIN PEARL ESSENCE	0.100
Electrical Utilities		
MA0005118	NANTUCKET GAS & ELECTRIC	4.100
NH0020338	SEABROOK 1 & 2	1200.000
Offshore Oil & Gas		
(none)		

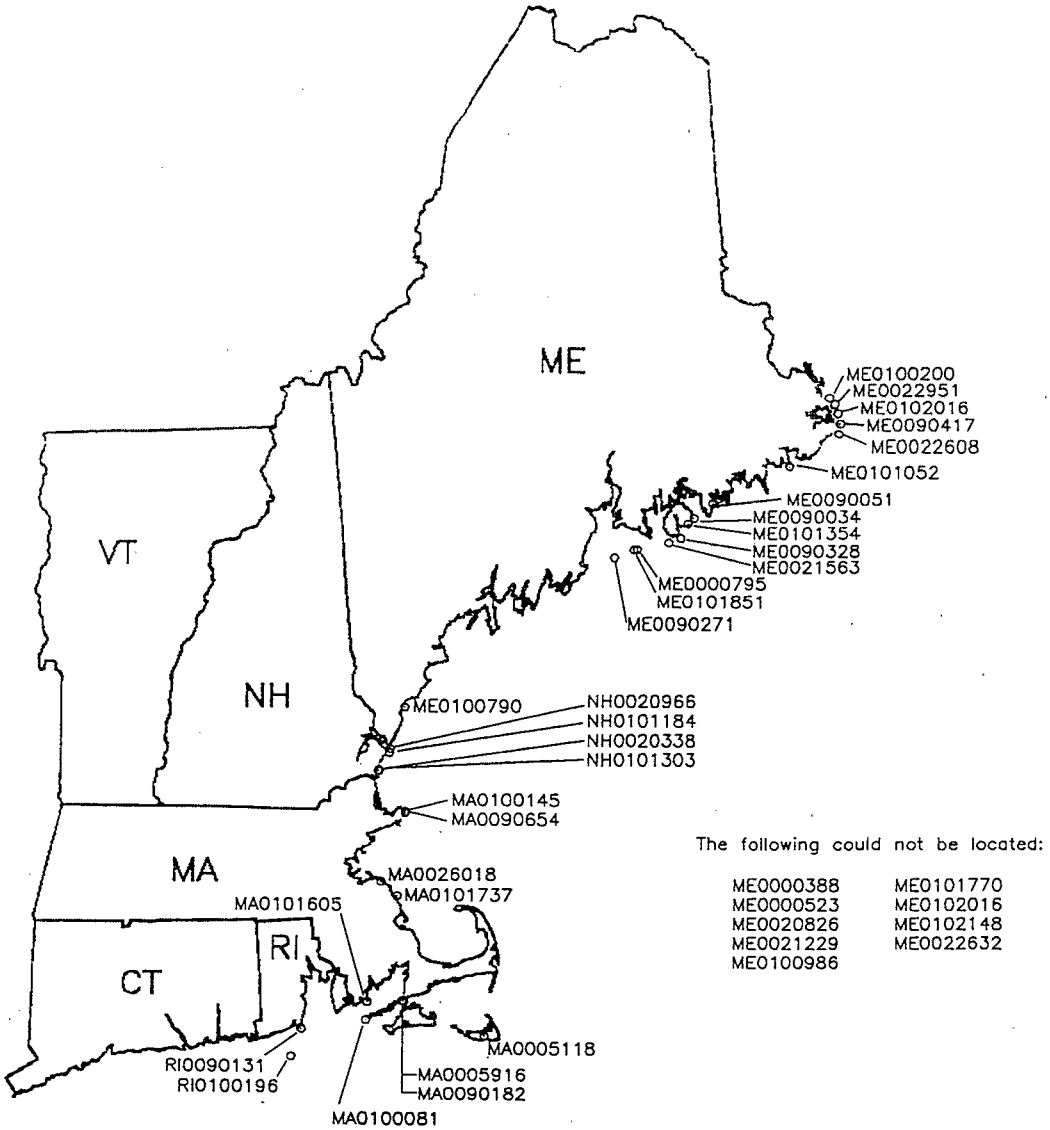


Figure 7. Summary of 403(c) Discharges in Region I.

are of concern are deposition of organic matter and nutrients which are a component of the fish food.

Region II

Region II includes the authorized coastal States of New York and New Jersey, and the territories of Puerto Rico and the U.S. Virgin Islands (see Figures 8 and 9). There are several ocean discharges (primarily POTWs) in New Jersey (16) and New York (2). Several of these discharges have flows in excess of 5 mgd. Both States have NPDES permitting authority, and have performed 403(c) reviews in varying detail for these discharges as part of the permitting process.

The near-shore Middle Atlantic area of Region II is subject to dramatic fluctuations in temperature and associated population/species changes. This area is also characterized by significant commercial and recreational fishing resources, and is subject to extensive influence from man's activity in this heavily populated area. Water quality problems reported in the inner New York Bight include sewage-related high BOD, excessive bacterial densities, oil and grease, and high concentrations of heavy metals, PCBs and potentially toxic materials associated with ocean dumping. As might be expected, this area has been the subject of much discussion and concern. The New York Bight Restoration Program is currently underway in Region II to address these concerns.

Region II EPA retains responsibility for issuing NPDES permits for Puerto Rico. There are 54 ocean discharges in Puerto Rico and 24 in the Virgin Islands subject to 403(c). Nine of the Puerto Rico discharges are major POTWs (> 5 mgd). To date, no 403(c) reviews have been performed for these territorial discharges; however, EPA Region II has completed three 301(h) waiver reviews in Puerto Rico and one in the Virgin Islands. 301(h) evaluations cover the criteria of a 403(c) review. EPA Region II is reviewing the remaining discharges as their NPDES permits come up for reissuance.

The tropical waters of the Virgin Islands and Puerto Rico exhibit less seasonal variation than other regions and biological productivity is generally lower. Commercial fisheries are locally important, but occur mainly in deep waters outside the Puerto Rico shelf. Sandy beaches, coral reefs, and a variety of fish and shellfish provide important recreational resources. Marine circulation is strongly influenced by westward-flowing tradewinds, land and sea breezes, and coastal configuration. The north coasts of Puerto Rico and the Virgin Islands are relatively exposed and shelf area is limited. Conditions are normally less severe along the south coast and this area is generally more productive. Many areas of special concern are located in the waters of the Virgin Islands and Puerto Rico, including coral reefs, mangroves, and seagrass beds. These critical habitats provide breeding grounds and habitat for a variety of species and are extremely sensitive to environmental disturbance. Water quality problems, particularly in areas of reduced circulation or near rivers, are not uncommon.

REGION 2 - New York, New Jersey	Flow (MGD)
Sewage Treatment Plants	
NJ0024473 ATLANTIC COUNTY STP	18.370
NJ0024520 TOWNSHIP OF OCEAN STP	3.640
NJ0024562 SOUTH MONMOUTH STP	2.920
NJ0024694 MONMOUTH COUNTY STP	33.000
NJ0024708 BAYSHORE STP	8.000
NJ0024783 LONG BRANCH STP	3.980
NJ0024872 TOWNSHIP OF NEPTUNE STP	3.970
NJ0025241 CITY OF ASBURY PARK STP	3.000
NJ0025356 TOWNSHIP OF MIDDLETOWN STP	10.800
NJ0026018 OCEAN COUNTY UTILITIES STP	20.000
NJ0026735 NE MONMOUTH CITY STP	6.590
NJ0028142 OCEAN COUNTY STP	28.000
NJ0029408 OCEAN COUNTY STP	2.950
NJ0035343 OCEAN CITY STP	6.300
NJ0052990 CAPE MAY CO-7 STP	7.670
NY0026859 NASSAU COUNTY STP	76.000
NY0104809 SUFFOLK COUNTY STP	1.000
Industrial (Conventional Pollutants)	
(none)	
Industrial (Toxic Pollutants)	
NJ0004120 TOMS RIVER CHEM CORP	5.000
Electrical Utilities	
(none)	
Offshore Oil & Gas	
(none)	

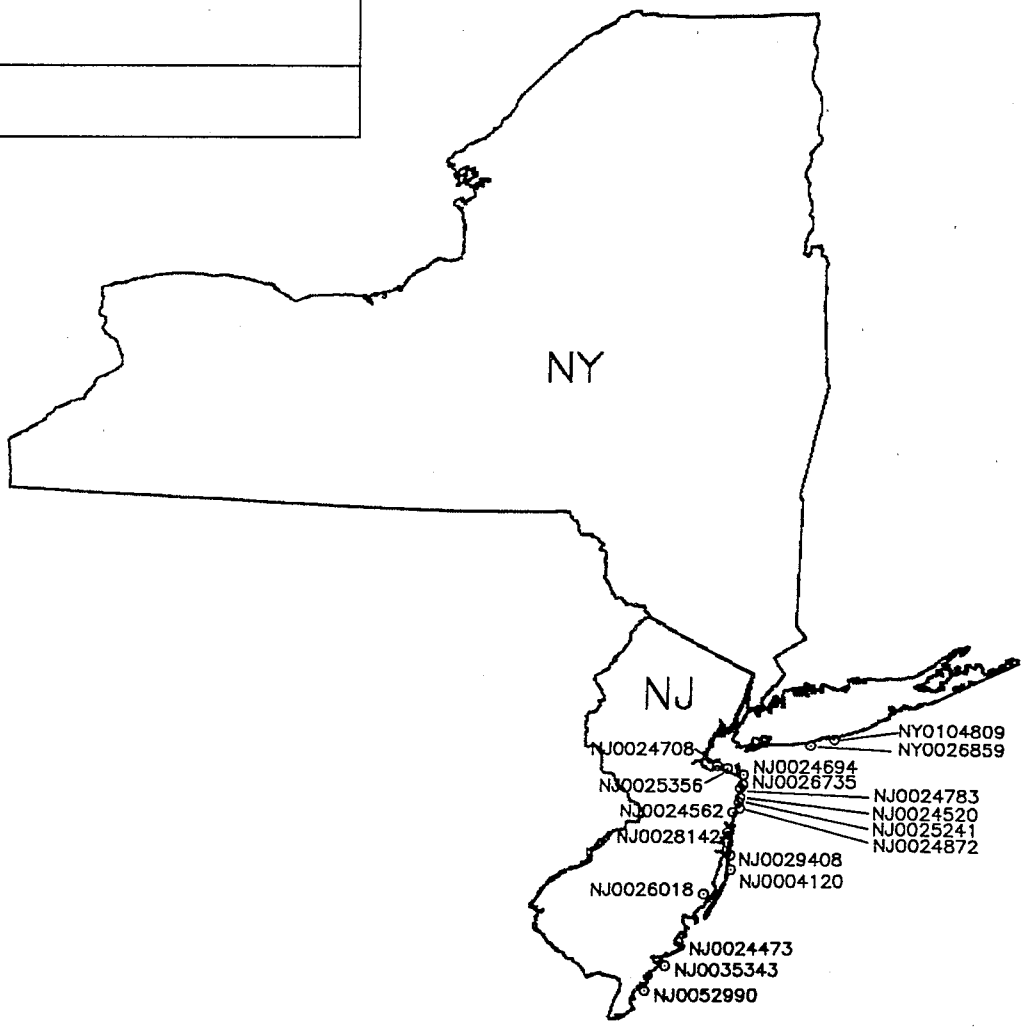


Figure 8. Summary of 403(c) Discharges in Region II (New York and New Jersey).

REGION 2 - Puerto Rico and Virgin Is. Flow (MGD)

Sewage Treatment Plants		
PR0020010	ROOSEVELT ROADS STP	2.000
PR0020044	U.S. NAVY COMMUNICATION	0.170
PR0020231	PRASA MARABELLA I STP	0.140
PR0020265	PRASA MARABELLA II STP	3.500
PR0020486	PRASA GUANICA	0.330
PR0020516	PRASA HATILLO STP	0.500
PR0020656	PRASA MAUNABO STP	0.300
PR0020788	PRASA RINCON	0.280
PR0020931	PRASA VIEQUES	0.163
PR0021237	PRASA BARCELONETA STP	8.330
PR0021539	HERITAGE COMMUNITIES STP	0.100
PR0021563	PRASA PONCE STP	12.000
PR0021776	PRASA RAMEY STP	2.500
PR0022055	PRASA GUAYAMA STP	1.000
PR0022063	PRASA AQUADILLO STP	1.000
PR0022071	PRASA ARECIBO STP	1.000
PR0022080	PRASA ISABELLA	1.000
PR0022098	PRASA ARROYO STP	0.700
PR0022250	PRASA ISABELLA STP	1.000
PR0023027	PRASA VILLA TAINA	0.110
PR0023116	SECOND UNIT PASTILLO	0.010
PR0023710	PRASA ARECIBO	10.000
PR0023728	PRASA BAYAMON STP	25.000
PR0023736	PRASA AQUADILLA STP	8.000
PR0023744	PRASA CANURY STP	3.020
PR0023752	PRASA CAROLINA	45.000
PR0023761	PRASA SANTA ISABEL STP	1.000
PR0023795	PRASA MAYAGUEZ RWWTP	22.500
PR0023850	PRASA DORADO STP	8.450
PR0023876	PRASA FAJARDO STP	6.600
VI0020036	ST. CROIX STP	4.000
VI0020125	NADIR ESTATE STP	0.250
VI0020150	FAA STP	0.010
VI0039829	FRENCHMAN'S REEF STP	2.000
VI0039837	CANEEL BAY-ST JOHN STP	0.265
VI0039853	COWPET BAY WEST STP	0.035
VI0039870	AMER. YACHT HARBOR STP	0.100
VI0039900	COWPET BAY EAST STP	1.000
VI0039934	SAPPHIRE BAY WEST STP	1.000
VI0039942	CRUZ BAY STP	0.100
VI0040126	JOHN MCVIE STP	0.004
VI0040134	WATERGATE VILLAS STP	0.066
VI0040185	D & C DEVELOPMENT STP	1.000
VI0040193	WATER BAY MANAGEMENT STP	0.100
VI0040215	K R DEVELOPMENT STP	0.100
VI0110027	USN SUPPLY DEPOT STP	0.370

Industrial (Conventional Pollutants)		
PR0000094	NEPTUNE PACKING	0.694
PR0000167	CORP AZUCARERA DE PUERTO RICO	31.380
PR0000183	BUMBLEBEE	1.115
PR0000230	NATIONAL PACKING	2.440
PR0000299	STARKIST CARIBE	2.000
PR0000591	BACARDI CORP.	0.400
PR0000655	BACARDI CORP.	0.070
PR0000680	P.R. DISTILLERS	1.000
PR0021105	SUN HARBOR CARIBE	1.320
PR0021954	NEPTUNE PACKING CORP	0.015
PR0021962	V.C.S. NATIONAL PACKING CO.	1.730
PR0022012	STAR KIST CARIBE INC.	2.000
PR0022110	BUMBLE BEE PUERTO INC.	2.500
PR0023043	MAYAGUEZ WATER TREATMENT CO.	4.320
VI0020052	VIRGIN ISLANDS RUM IND.	0.110

Industrial (Toxic Pollutants)		
PR0000342	COMMONWEALTH OIL PETROCHEMICAL	62.000
PR0000345	COMMONWEALTH OIL PETROCHEMICAL	14.900
PR0000400	YABUCOA SUN OIL CO.	4.000
PR0000418	UNION CARBIDE CARIBE INC.	N/A
PR0022322	PHILLIPS PUERTO RICO CORE INC.	2.100
PR0022284	SK&F LAB CORP	0.018
PR0024724	AYERST-WYETH PHARMACEUTICALS	0.210
VI0040037	GALLOWS POINT DEVELOPMENT CORP	0.100
VI0040088	YACHT HAVEN HOTEL AND MARINA	0.030
VI0040096	FRANK MCCARTHY	0.004
VI0040177	SEA CLIFF BEACH RESORT	0.020
VI0040291	CORAL WORLD INC	0.001
VI0040312	BAYSIDE RESORT	0.057

Electrical Utilities		
PR0001031	PUERTO RICO ELECTRIC	650.000
PR0001147	SOUTH COAST 1-6	665.000
PR0001660	AGUIRRE	652.000
VI0000060	V.I. WATER AND POWER	10.000

Offshore Oil & Gas
(none)

The following could not be located:

PR0020231	VI0020150	VI0040126
PR0020265	VI0039870	VI0040134
PR0022322	VI0039900	VI0040177
PR0023116	VI0039934	VI0040185
PR0023710	VI0040037	VI0040193
PR0023795	VI0040088	VI0040215
PR0024724	VI0040096	VI0040312
		VI0110027

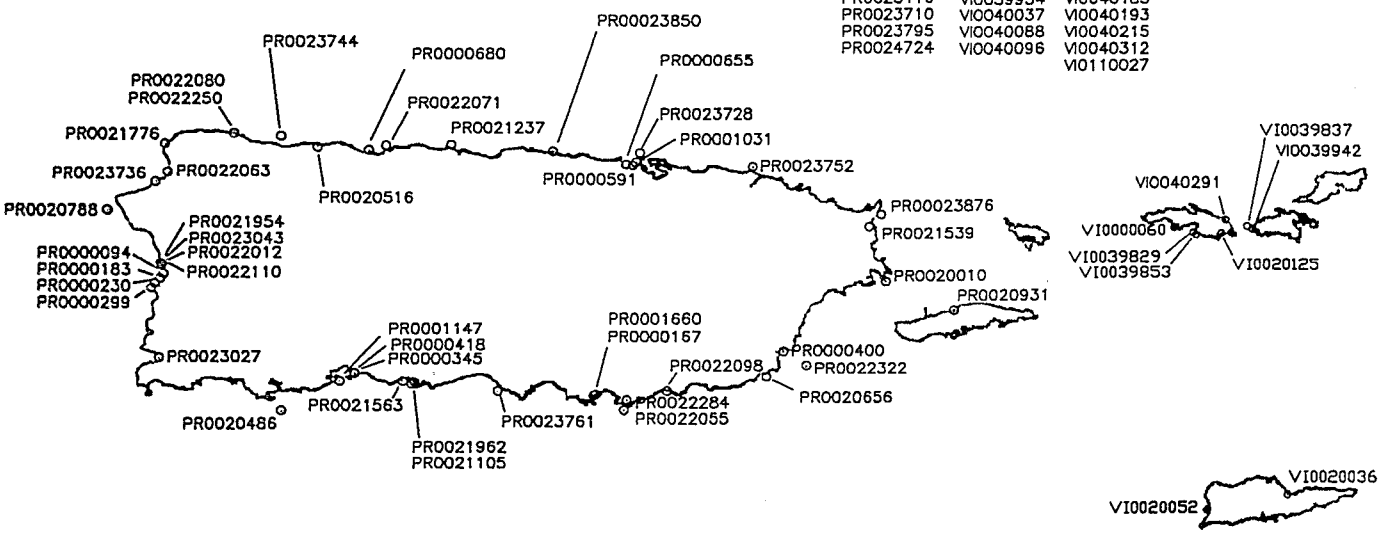


Figure 9. Summary of 403(c) Discharges in Region II (Puerto Rico and Virgin Islands).

Region III

Region III includes the authorized coastal States of Delaware, Maryland and Virginia (see Figure 10). There are seven direct ocean discharges subject to 403(c). All seven are sewage treatment facilities, of which three are large POTWs, two are small POTWs, and two are private facilities. There are no industrial discharges subject to 403(c) in Region III. Region III reports that all of these discharges have received an effluent toxicity review to determine compliance with state water quality standards as required by the Clean Water Act under NPDES. However, 403(c) reviews have not yet been conducted.

The mid-Atlantic nearshore area is host to a complex ecosystem characterized by rapid onshore-offshore changes in water temperature and associated fauna. The area is an important commercial and recreational fishing resource. Sensitive coastal habitats in the mid-Atlantic region include the smaller coastal wetlands located within the barrier islands (e.g., Assateague Island National Seashore) that form much of the coastline. Although the health of the mid-Atlantic is relatively good compared to the New York Bight to the north, the potential long term effects of pollutants entering these waters are being studied.

A future 403(c) issue for Region III will be the increasing number of applications for ocean discharge permits by coastal communities wishing to consolidate several small, backbay (non 403(c)) discharges into larger facilities with ocean outfalls. These communities may be required to perform an alternatives analysis (i.e., land application, alternative disposal sites) in addition to an extensive monitoring program as part of the 403(c) review process.

Region IV

Although Region IV includes six coastal States (see Figure 11), only Florida and North Carolina have ocean discharges subject to 403(c) regulation. Florida is also the only State in Region IV not authorized to administer the NPDES permit program. Most of the major 403(c) discharges in Florida are large POTWs serving the lower Southeast area. In addition to these, there are approximately 10 small discharges located in the Florida Keys. The status of these with respect to 403(c) is questionable because the location of the baseline in this area is not clear. For the 6 POTWs in south Florida, EPA Region IV has made a finding of "insufficient information" under 403(c) regarding the level of environmental impact from these facilities. Monitoring studies are currently underway at these active discharges to assess impacts to the receiving waters.

Throughout the southern Florida area are vast estuaries, tidal marshes, seagrass beds, mangrove swamps, shallow mud and sand flats, and coral reefs which provide breeding, nursery, and feeding grounds for a range of species. This diversity of natural features along with the influence of the Gulf Stream produces a variety of marine resources. The natural features and recreational opportunities in the coastal south Atlantic create an ideal setting for a major tourist industry. Southern Florida shelf waters are fairly saline compared to coastal

REGION 3	Flow (MGD)
Sewage Treatment Plants	
DE0050008 SOUTH COASTAL STP	6.000
MD0020044 WORCHESTER CO. STP	12.000
MD0021091 DEPT. INTERIOR ASSATEAGUE STP	0.017
MD0023477 MARYLAND MARINE UTILITIES STP	1.000
MD0024911 BERLIN SHOPPING CENTER STP	0.004
VA0031917 FORT STORY-US ARMY TRANSPORT STP	1.000
VA0062618 HAMPTON ROADS STP	36.000
Industrial (Conventional Pollutants) (none)	
Industrial (Toxic Pollutants) (none)	
Electrical Utilities (none)	
Offshore Oil & Gas (none)	

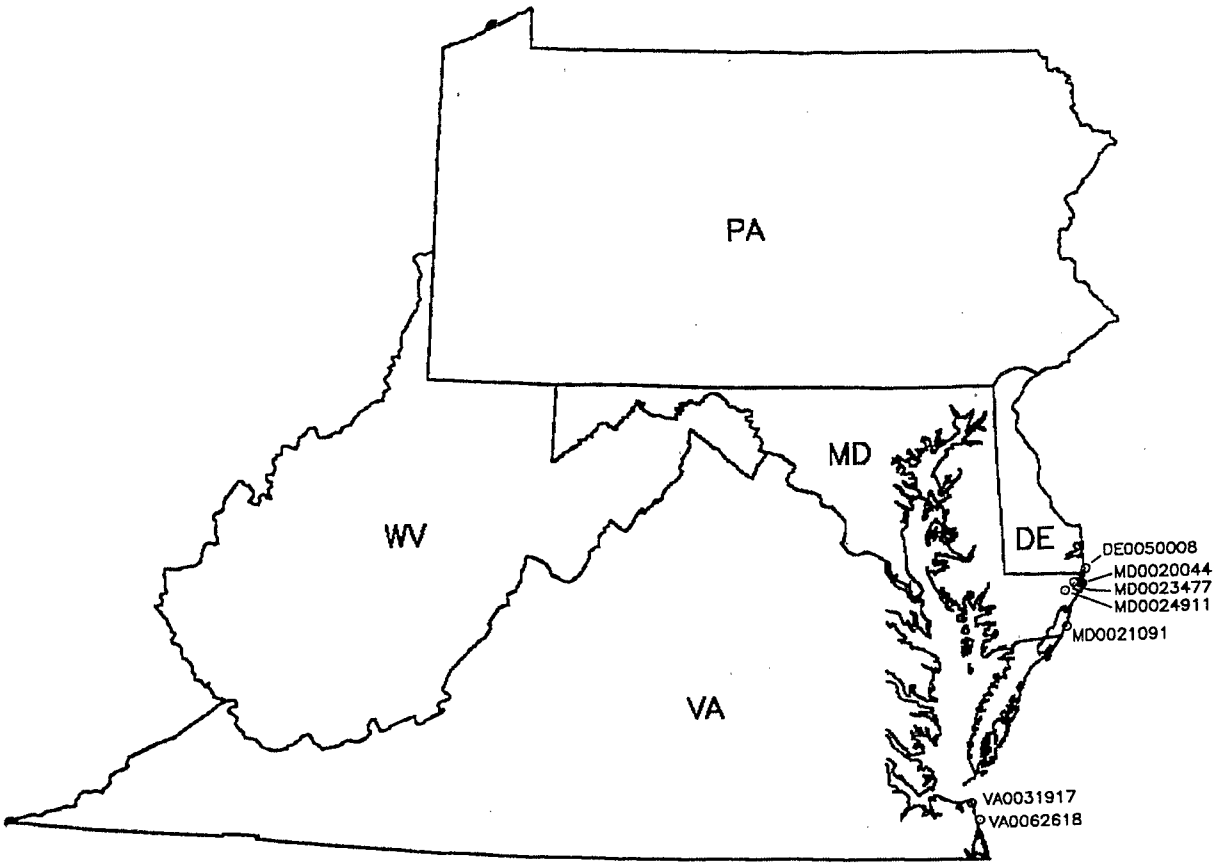
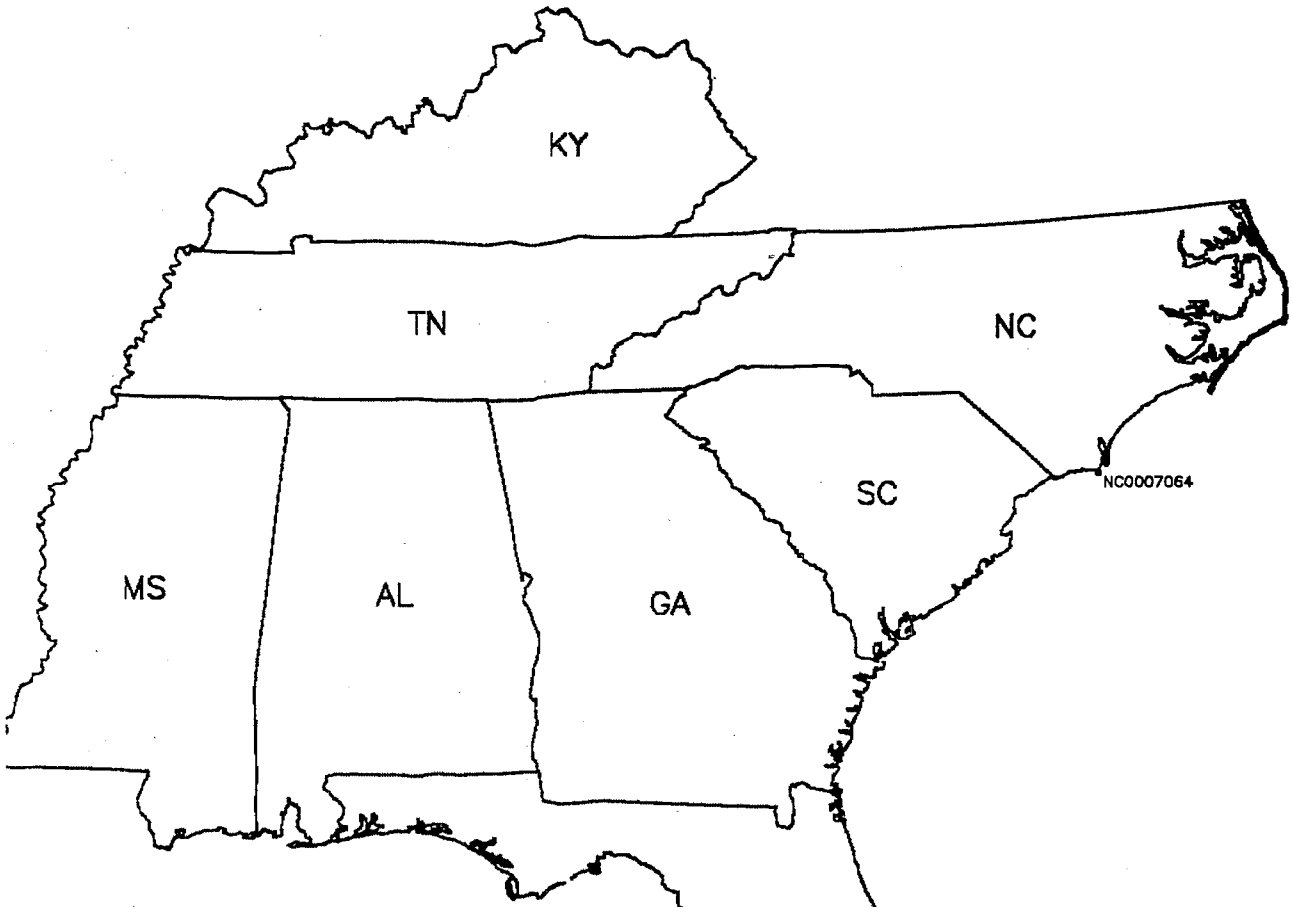


Figure 10. Summary of 403(c) Discharges in Region III.



REGION 4	Flow (MGD)
Sewage Treatment Plants	
FL0024805 VIRGINIA KEY STP	133.000
FL0025976 KEY WEST STP	5.000
FL0026255 HOLLYWOOD STP	31.720
FL0026344 BOCA RATON STP	11.800
FL0029289 GEIGER KEY MARINA STP	0.005
FL0031771 BROWARD COUNTY STP	66.000
FL0032182 MIAMI-DADE NORTH DISTRICT STP	80.000
FL0033847 COCONUT GRVE TRAIL. PK STP	0.006
FL0033855 WALES EDGE COLONY STP	0.007
FL0033901 SEABREEZE TRAILER PARK STP	0.007
FL0034924 VENTURE OUT IN AMERICA STP	0.070
FL0035025 MAN-O-WAR HOTELS STP	0.005
FL0035068 BOYD'S CAMPGROUND STP	0.020
FL0035980 DEL RAY BEACH STP	24.000
Industrial (Conventional Pollutants)	
FL0031186 SINGLETON SHRIMP	0.023
FL0035793 MARATHON SEAFOODS	0.000
Industrial (Toxic Pollutants)	
(none)	
Electrical Utilities	
FL0000159 CRYSTAL RIVER 1-3	1970.000
FL0002208 ST. LUCIE 1	763.000
NC0007064 BRUNSWICK 1-2	2000.000
Offshore Oil & Gas	
GMG280000 GENERAL OFFSHORE OIL & GAS (SEE REGION 6)	

Figure 11. Summary of 403(c) Discharges in Region IV.

waters further north. This high salinity results from low fresh water runoff and close proximity to the Gulf Stream. Live bottom areas are of special concern because of their biological productivity as well as their use as fish habitats. Mangrove swamps, also areas of concern, serve as nursery grounds for commercially important fin and shellfish species.

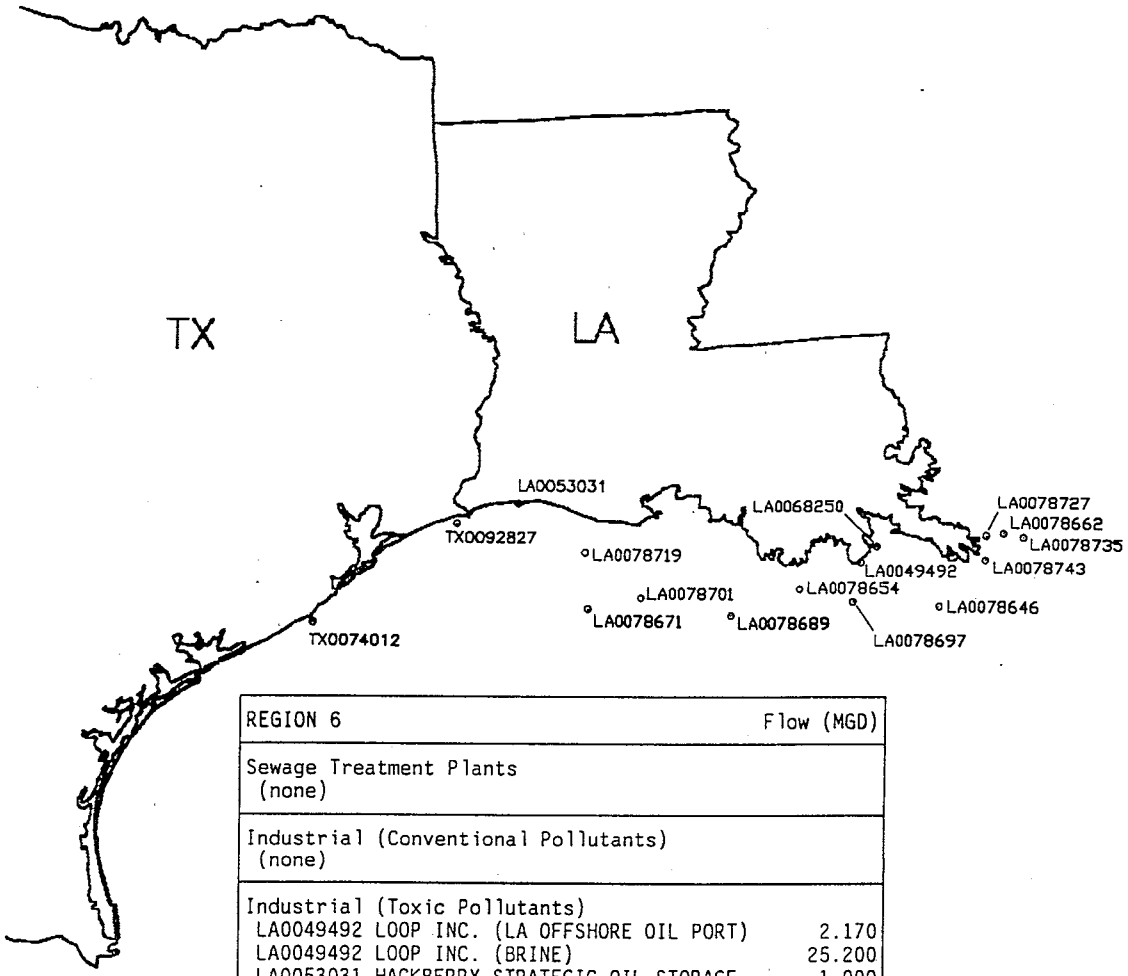
Region IV offshore oil and gas activities in the Gulf of Mexico are covered by the NPDES general permit issued with Region VI. Several individual permits have been issued under the general permit provisions due to the presence of live bottom areas off of Florida. In one case, the operator has experienced live bottom conditions that seem to be associated with drilling platform structures. In North Carolina, Mobil has submitted an application to drill in Federal offshore waters. EPA developed a permit for this activity in FY89. There are no other oil and gas activities in the Atlantic OCS region.

As in Region III, a growing issue in Region IV concerns the desire of rapidly growing Gulf coastal communities to consolidate smaller "back bay" sewage treatment facilities into larger, centralized facilities that would discharge directly to the Gulf of Mexico via ocean outfalls. The section 403(c) regulations provide a mechanism to the regulatory agencies to evaluate potential impacts of these consolidated discharges by requiring an alternatives analysis to be performed for all new proposed ocean discharges.

Region VI

Region VI includes the non-NPDES authorized coastal States of Texas and Louisiana (see Figure 12). There are 17 ocean dischargers under individual NPDES permits (2 in TX, 15 in LA) and one general permit exists for offshore oil and gas activities in the Gulf of Mexico. The 403(c) discharges in Region VI are all industrial related, and include: several temporary sulphur mine shallow exploratory wells (which account for 12 of the 17 individual permits); the Louisiana Offshore Oil Port (LOOP, Inc.), which consists of several minor discharges and a major brine discharge; and two offshore brine discharges from the Federal Strategic Petroleum Reserve activities in Texas. All of these discharge activities have been reviewed with respect to 403(c) criteria. In particular, EPA prepared a major ODCE on the offshore oil and gas activity prior to issuing the general permit for the Gulf of Mexico. This general permit, issued in 1986 and expiring in 1991, covers the largest number of offshore oil and gas platforms, exploration activities, and production activities in the Nation.

The Gulf of Mexico is an important national resource; a wealth of both biological and mineral assets are actively exploited. The coastal estuaries, wetlands, and barrier islands of the Gulf provide critical habitat for large populations of wildlife, including waterfowl, shorebirds, and colonial nesting seabirds. The extensive coastal wetlands of the Gulf comprise approximately one-half of the nation's total. Although the Gulf of Mexico was once viewed as one of the healthiest of our coastal marine environments, the Gulf has begun to show signs of deteriorating environmental quality: nutrient over-enrichment, increased con-



REGION 6	Flow (MGD)
Sewage Treatment Plants	
(none)	
Industrial (Conventional Pollutants)	
(none)	
Industrial (Toxic Pollutants)	
LA0049492 LOOP INC. (LA OFFSHORE OIL PORT)	2.170
LA0049492 LOOP INC. (BRINE)	25.200
LA0053031 HACKBERRY STRATEGIC OIL STORAGE	1.000
LA0068250 FREEPORT SULPHUR-CAMINANDA MINE	4.300
LA0078646 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078654 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078662 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078671 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078689 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078697 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078701 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078719 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078727 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078735 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
LA0078743 FREEPORT SULPHUR-SHALLOW EXPL WELL	1.000
TX0074012 STRATEGIC PETROLEUM RES	42.070
TX0092827 BIG HILL STRATEGIC PETR RESERVE	71.400
Electrical Utilities	
(none)	
Offshore Oil & Gas	
GMG280000 GENERAL OFFSHORE OIL & GAS (SEE REGION 4)	

Figure 12. Summary of 403(c) Discharges in Region VI.

centrations of toxics and pesticides, habitat degradation, freshwater diversion, and increasing risk to public health.

Region IX

Region IX has the most land-based 403(c) discharges both by number of discharges and by total flow. The coastal States in Region IX are California, Hawaii, and the Pacific Islands (see Figures 13 and 14). Both California and Hawaii have authority for NPDES permitting. EPA retains permit authority for discharges located in the Pacific Islands (i.e., Guam, American Samoa, Republic of Palau, and Northern Marianas). Water quality objectives and effluent quality requirements for point source discharges in California territorial waters are specified in the State standards. California is unique in that it has specific standards for ocean waters. These are contained in the Water Quality Control Plan For Ocean Waters of California (California Ocean Plan) and are the State's water quality standards for ocean waters. The objective of the California Ocean Plan is to protect the quality of State ocean waters for the use and enjoyment by the people of the State. A triennial review of State standards is required by the CWA. The State Water Resources Control Board reviews the plan at least every three years to ensure that the current standards are adequate, to prevent degradation to the marine habitat and marine species, and to minimize threats to public health.

Recent revisions of Hawaii's State water quality standards for ocean waters have made these standards more protective than before.

Major categories of dischargers that currently discharge beyond the baseline include POTWs, exploratory oil and gas offshore drilling operations, oil refineries, power plants, sugar mills, pulp and paper mills, sawmills, and seafood processors. Therefore, these dischargers are subject to 403(c) requirements.

POTWs in compliance with 301(h) variance requirements are presumed not to cause unreasonable degradation of the marine environment for any specific pollutants or conditions specified in the variance (40 CFR 125). Therefore, these POTWs are considered to be in compliance with 403(c) criteria. Eighteen of the 51 POTWs subject to 403(c) in Region IX have received tentative or final approvals for 301(h) waivers. As in every State, California's POTWs that do not discharge under section 301(h) modified permits must meet secondary requirements as is mandated by the CWA. All permits are in compliance with State standards unless they have a waiver, e.g., 301(h). Hence, all California POTWs should be in compliance with all or many of the provisions of the 403(c) regulations. Currently, EPA Region IX is overseeing a major Environmental Impact Statement for the Los Angeles Hyperion POTW. This POTW, with a flow of over 400 mgd, is one of the Nation's largest POTWs discharging to ocean waters.

A preliminary Ocean Discharge Criteria Evaluation (ODCE) for offshore oil and gas drilling and production operations in southern California has been completed by EPA (JRB Associates 1984). A detailed summary of effluent characteristics, transport and fate, toxicity and bioaccumulation, environmental impacts, and receiving

REGION 9 - California		Flow (MGD)
Sewage Treatment Plants		
CA0022756	CRESCENT CITY STP	1.400
CA0022870	MENDOCINO STP	0.300
CA0023078	FORT BRAGG STP	5.000
CA0024040	MENDOCINO STP	0.080
CA0024333	UCLA BODEGA LAB STP	0.250
CA0037494	PACIFICA STP	2.260
CA0037681	SAN FRA. (RICHMOND STP)	21.800
CA0037737	NORTH SAN MATEO STP	14.000
CA0047364	CARPINTERIA STP	1.300
CA0047830	AVILA STP	0.180
CA0047881	MORRO BAY STP	1.650
CA0047899	MONTECITO STP	1.000
CA0047961	SAN SIMEON STP	0.150
CA0047988	MARINA STP	0.780
CA0047996	CARMEL STP	0.660
CA0048003	SO. SAN LUIS OBISPO STP	2.500
CA0048054	SUMMERLAND STP	0.080
CA0048143	SANTA BARBARA STP	7.570
CA0048151	PISMO BEACH STP	1.200
CA0048160	GOLETA STP	6.530
CA0048194	SANTA CRUZ STP	13.400
CA0053651	SAN BUENAVENTURA STP	14.000
CA0053813	L.A. COUNTY STP	351.100
CA0053856	L.A. TERMINAL IS. STP	20.000
CA0054097	OXNARD STP	18.300
CA0054372	AVALON STP	0.750
CA0107409	SAN DIEGO STP	130.900
CA0107417	SERRA STP	9.000
CA0109991	L.A. HYPERION STP	404.000
CA0110078	USN CENTERVILLE STP	0.025
CA0110175	USN UNDERSEA STP	0.025
CA0110591	USN FUEL & AMMO STP	0.150
CA0110604	ORANGE CO. STP	232.200
CA0111015	USN SUPPLY STP	0.050
CA0111135	US ARMY NIKE 88S STP	0.010
Unassignd	US ARMY CORPS OF ENGINEERS	3.510
Industrial (Conventional Pollutants)		
CA0048909	SEA PRODUCTS - MOSS BAY	0.030
Industrial (Toxic Pollutants)		
CA0000051	UNION OIL	0.312
CA0000230	CHEVRON	0.680
CA0000337	CHEVRON	6.610
CA0000761	CONTINENTAL OIL	0.760
CA0002305	UNION OIL	0.080
CA0005282	CROWN SIMPSON	18.370
CA0005304	GEORGIA PACIFIC	0.980
CA0005894	LOUISIANA PACIFIC	16.400
CA0056201	REYNOLDS METALS	0.050
CA0105660	BOATSWAINS LOCKER	0.001

Electrical Utilities		
CA0000353	HAYNES 1-6	712.500
CA0000361	HARBOR 1-5	199.500
CA0000370	SCATTERGOOD 1-3	319.700
CA0001139	ALAMITOS 1-6	987.900
CA0001147	EL SEGUNDO 1-4	297.170
CA0001163	HUNTINGTON BEACH 1-4	349.900
CA0001171	LONG BEACH 10-11	112.120
CA0001180	MANDALAY 1-2	245.800
CA0001198	ORMOND BEACH 1-2	0.475
CA0001201	REDONDO BEACH 1-8	567.300
CA0001228	SAN ONOFRE 1	461.000
CA0001350	ENCINA 1-5	1150.000
CA0001376	SILVERGATE 1-4	170.000
CA0001384	STATION B 1-4	120.000
CA0003743	MORRO BAY 1-4	539.600
CA0003751	DIABLO CANYON 1-2	782.800
CA0005622	HUMBOLDT	2.200
Offshore Oil & Gas		
CAG280605	Draft OFFSHORE OIL & GAS	
CAG280622	Draft OFFSHORE OIL & GAS	

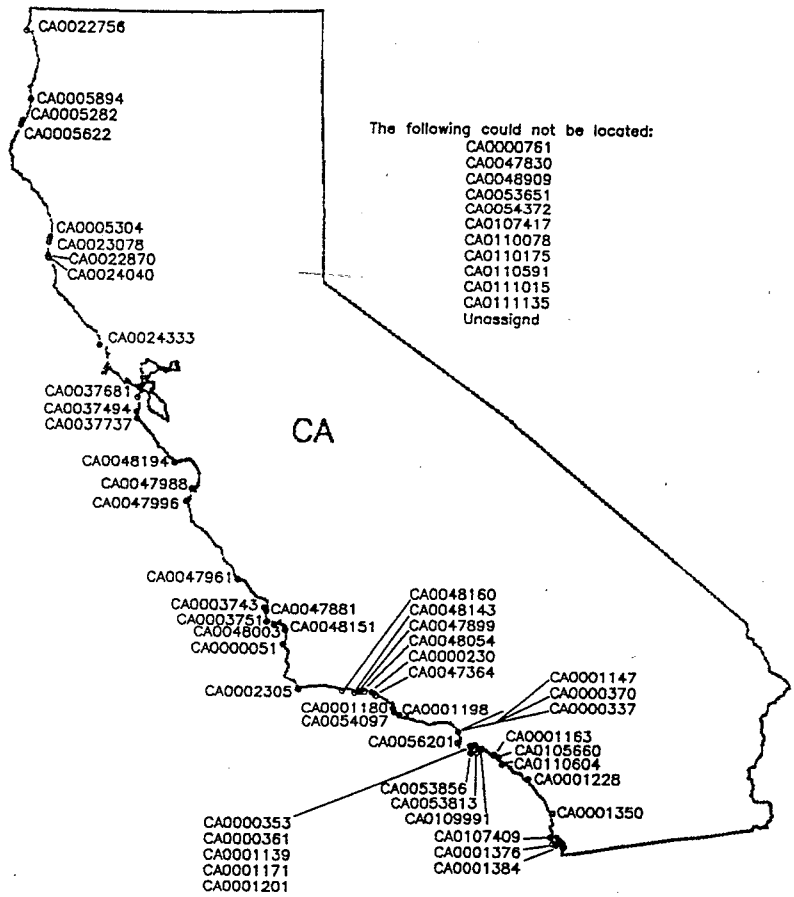
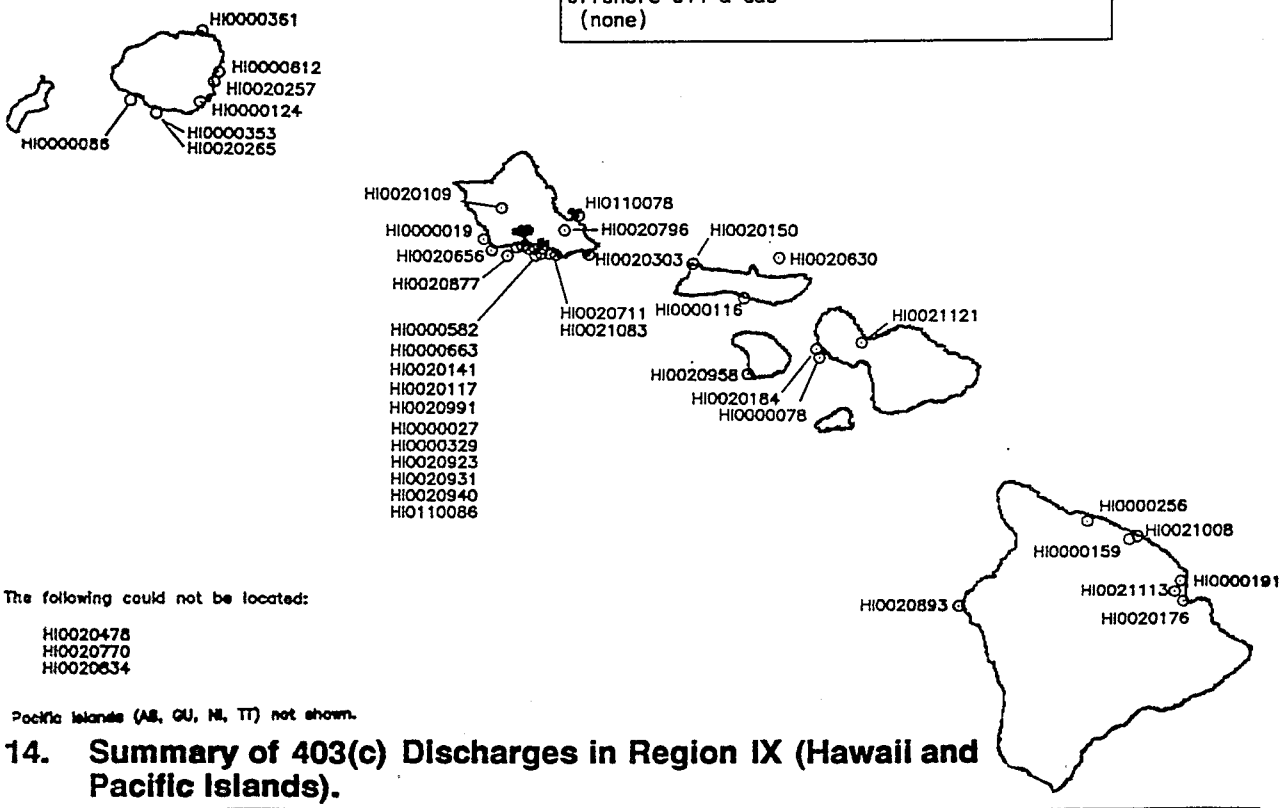


Figure 13. Summary of 403(c) Discharges in Region IX (California).

REGION 9 - Hawaii & Pacific Is.		Flow (MGD)
Sewage Treatment Plants		
AS0020001	ASPA, UTULEI STP	0.570
AS0020010	ASRA, TAFUNA STP	0.950
GU0000035	USN GUAM SHIP STP	0.012
GU0020087	PUAG AGANA BAY STP	10.000
GU0020109	PUAG COMMERCIAL PORT ST	0.050
GU0020141	PUAG NORTH DISTRICT STP	12.000
GU0020222	PUAG AGAT SANTA RITA ST	0.750
GU0020257	COCUS ISLAND RESORT STP	0.100
GU0110019	USN PUBLIC WORKS STP	3.200
HI0000612	HI DEPT OF HEALTH	0.150
HI0020109	COUNTY OF HONOLULU STP	1.720
HI0020117	HONOLULU C&C STP	82.000
HI0020141	HONOLULU C&C STP	7.000
HI0020150	HONOLULU C&C STP	4.300
HI0020176	CO. OF HAWAII STP	7.000
HI0020184	MAUI-LAHAINA STP	3.200
HI0020257	KAUAI-WAILUA STP	0.500
HI0020265	KAUAI-ELEELE STP	0.400
HI0020303	E. HONOLULU COMM. STP	3.900
HI0020478	ZIONS SECURITIES STP	0.133
HI0020770	HAWAII KULAIMANO STP	0.500
HI0020877	HONOLULU C&C STP	25.000
HI0110078	USMC KANEO STP	2.000
HI0110086	USN FORT KAMEHAME STP	7.500
NI0020010	CUC, SADOL, TASI STP	0.300
NI0020028	CUC, AGINGAN STP	1.000
TT0020061	DPW, MALAKAL STP	1.000
Industrial (Conventional Pollutant		
AS0000019	STAR-KIST	1.250
AS0000027	SAMOA PACKING CO.	0.520
HI0000078	PIONEER MILL CO.	0.500
HI0000086	KEKAHA SUGAR CO.	99.100
HI0000116	OKOKELE SUGAR CO.	2.000
HI0000124	LIHUE PLANATION CO.	3.000
HI0000159	HAMAKUA SUGAR CO. INC.	4.100
HI0000191	HILO COAST PROCESS. CO.	20.190
HI0000256	KONOKAA SUGAR CO.	14.000
HI0000361	MCBRIDE SUGAR CO.	0.375

Industrial (Toxic Pollutants)		
AS0020036	MARINE RAILWAY AUTH.	0.100
GU0020036	MOBIL CABRAS	0.000
GU0020079	ESSO EASTERN INC.	0.000
GU0020168	UNIVERSITY OF GUAM	0.288
GU0020249	LOCKHEED AIR TERMINAL	0.100
GU0110078	NAVAL DEBALL	0.370
GU0110124	USN, SUPPLY	0.100
HI0000329	CHEVRON	5.300
HI0000582	SHELL OIL (HONOLULU)	0.023
HI0000663	PACIFIC RESOURCES	0.000
HI0020630	WAIKIKI AQUARIUM	0.600
HI0020656	HAWAIIAN MILLING CO.	0.100
HI0020711	ALA WAI MARINE LTD.	0.100
HI0020796	AMEROA HCHD	0.027
HI0020834	DEL MARK CORP.	0.050
HI0020893	NATURAL ENERGY LAB	0.100
HI0020923	CHEVRON HONOLULU MAIN	0.100
HI0020931	CHEVRON HONOLULU T	0.100
HI0020940	CHEVRON KAPALANA T	0.100
HI0020958	LANAI OIL CO.	0.100
HI0020991	PAULEY PETROLEUM, INC.	0.100
HI0021008	AKONA PETROLEUM	0.100
HI0021083	HAWAIIAN CEMENT	0.100
HI0021113	CO. OF HAWAII-PAPLKAU PAUKOA	0.100
HI0021121	CHEVRON KAHULUI TERRAL	0.100
NI0020117	MOBIL OIL. ROTA, CNMI	0.100
NI0020125	MOBIL OI. SAIPAN, CNMI	0.000
NI0020133	MOBIL OIL, TINIAN, CNMI	0.000
NI0020290	HARA ADAI HOTEL, CNMI	0.100
TT0020095	MOBIL OIL, PALAU	0.000
Electrical Utilities		
GU0000019	USN, PITI PWR PLT	182.000
GU0000027	TANGUISSON POWER PLANT	99.000
GU0020001	GPA, CABRAS POWER PLANT	173.000
HI0000019	KAHE 1-5	647.000
HI0000027	HONOLULU 5, 7-9	304.000
HI0000353	CITIZENS UTILITIES	10.800
Offshore Oil & Gas		
(none)		



The following could not be located:

HI0020478
HI0020770
HI0020834

Pacific Islands (AS, GU, NI, TT) not shown.

Figure 14. Summary of 403(c) Discharges in Region IX (Hawaii and Pacific Islands).

water characteristics is presented in that report (see also Fact Sheet on oil and gas in Appendix C). Operators in southern California are complying with the BPT conditions under the general permit which expired in 1984, and is continued under administrative order.

Approximately 10 new dischargers have applied for and received individual permits with conditions similar to Region IX proposed BAT/BPJ general permits. Region IX proposed two BAT/BPJ permits. These new general permits, for oil and gas, are expected to be final this year; one covering exploration and the other covering development and production operations.

A number of power plants in California also discharge effluent to the ocean. Provisions regulating the thermal aspects of power plant effluent are specified in the Water Quality Control Plan for the control of temperature in the coastal and interstate waters and enclosed bays and estuaries of California (i.e., California's Thermal Plan).

There are several other categories of industries that discharge to the open ocean in Region IX. Two oil refineries in California and two in Hawaii are subject to evaluation under 403(c). Information on the environmental impacts of these facilities is limited (see Fact Sheet in Appendix C). Discharges from two pulp and paper mills in Region IX, located near Fairhaven, California, have been determined to be in compliance with section 301(m) of the CWA (see Fact Sheet in Appendix C). Although pulp and paper effluent can potentially be toxic to aquatic biota, no adverse impacts on indigenous benthic infauna or fish in the vicinity of the discharge have been observed. Most effluent solids appear to be transported out of the immediate discharge area by strong currents. However, these facilities are reportedly violating whole effluent chronic toxicity limits in their permits, and are currently the subject of an enforcement action. There are currently two sugar mills discharging into the ocean in the State of Hawaii under NPDES permits. Six other sugar mills have emergency discharge permits. The major pollutant of concern in sugar mill effluent that adversely impacts coral communities is suspended solids (see Fact Sheet in Appendix C). EPA is currently conducting a study on the impacts of two sugar cane mills on the island of Hawaii. One sawmill, located in Fort Bragg, CA, discharges effluent into the open ocean (see Fact Sheet in Appendix C). In addition, two seafood processor currently discharges into the ocean. One facility recently received an NPDES permit to discharge seafood processing wastewater from an existing but inactive ocean outfall (i.e., National Refractories' magnesium processing plant). Except for the pulp and paper discharges, however, which are under enforcement actions, these industrial facilities are reported to be in compliance with the State standards, as is required in their NPDES permits.

The coastlines of California and Hawaii encompass a wide variety of physical environments and biological communities. The nearshore area of California is typically an open coastal environment. Oceanographic conditions off California are predominantly controlled by the California Current System which extends seaward off the Washington-California coast. However, substantial differences exist in coastal orientation, coastal and submarine topography, wind and

wave conditions, and water properties (e.g., temperature, salinity) that can influence the local and regional circulatory patterns. The near-shore environment of the Hawaiian islands is extremely complex and variable. The receiving waters into which the sugar mills discharge are exposed to trade winds and are subject to heavy surf. Climatic conditions within the coastal areas of Region IX range from the temperate climate of northern California to the sub-tropical climate of Hawaii and Palau. The beneficial uses of the ocean waters of Region IX include industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment, navigation, commercial and sport fishing; aquaculture; preservation and enhancement of areas of special biological significance, rare and endangered species, marine habitat; fish migration and spawning; and shellfish harvesting.

Region X

U.S. EPA Region X includes the coastal States of Oregon, Washington and Alaska (see Figures 15 and 16). In Oregon and Washington, responsibility for implementing the 403(c) program has been authorized to the States as part of the NPDES program. Although there are many small communities and facilities along these coasts, the outfalls typically discharge to estuaries or rivers. Currently, there are only five dischargers subject to 403(c) criteria in Oregon and Washington. These include three pulp and paper mills in Oregon, and one small sewage treatment facility in each State. Ocean Discharge Criteria Evaluations (ODCEs) have not yet been performed for these dischargers.

U.S. EPA Region X has responsibility for implementing the 403(c) program in Alaska. There are potentially several hundred 403(c) dischargers in Alaska but the exact number is uncertain. Not only are there many more coastal facilities in Alaska, but the baseline delineating inland waters from the territorial sea has not yet been determined for much of the complex coastline of southeast Alaska. The ocean discharge criteria have been considered for many of the confirmed 403(c) dischargers. There is variation in the detail of the analyses, the effectiveness of monitoring programs, and the amount of review performed after the permits are issued. Most of the permits that EPA Region X has classified as major in Alaska are generally in compliance with 403(c) requirements. *(EPA classifies industrial dischargers as "major" or "minor" based on the following criteria: potential for toxic pollutant discharge, traditional pollutants in the effluent, potential health impacts, flow rate of the effluent, and various water quality factors. Municipal dischargers (sewage treatment plants) are classified as major according to the following criteria: ownership must be public, the facility must be active, and the flow rate must be 1 million or more gallons per day or a population of 10,000 must be served or the discharge must cause significant water quality impacts.)*

The initial 403(c) evaluations in Alaska were for exploratory oil and gas offshore drilling operations. Four of the current NPDES general permits account for 66 operations. Only 18 of these facilities are currently operating. In addition, one individual permit has been issued. The second major category of Alaskan ocean discharges are seafood processing facilities. There are currently 290 of these opera-

REGION 10 - Oregon, Washington	Flow (MGD)
Sewage Treatment Plants	
OR0022772 CITY OF NEWPORT STP	2.470
WA0025585 QUINALT INDIAN NATION STP	1.000
Industrial (Conventional Pollutants)	
(none)	
Industrial (Toxic Pollutants)	
OR0000221 INTERNATIONAL PAPER CO	6.970
OR0001341 GEORGIA-PACIFIC CORP TOLEDO PAPER	13.300
OR0023361 WEYERHAEUSER CO	0.100
Electrical Utilities	
(none)	
Offshore Oil & Gas	
(none)	

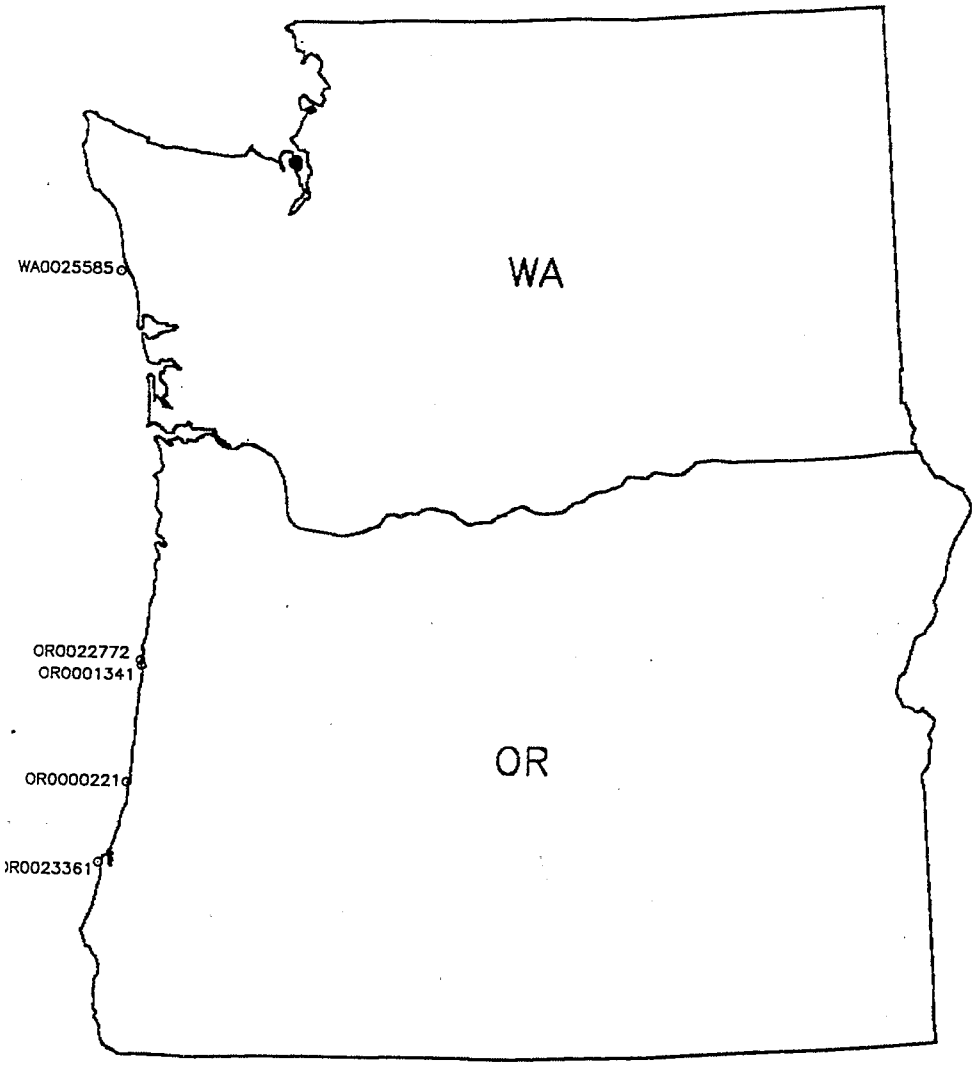


Figure 15. Summary of 403(c) Discharges in Region X (Oregon and Washington).

REGION 10 - Alaska	Flow (MGD)
Sewage Treatment Plants	
(none)	
Industrial (Conventional Pollutants)	
(none)	
Industrial (Toxic Pollutants)	
AK0029840 PRUDHOE BAY WATERFLOOD PROJECT	9.000
AK0038661 ENDICOTT DEVELOPMENT	1.300
AK0040487 SHEE ATIKA	0.100
AK0043192 WESTGOLD	47.800
AK0043354 KUPARUK WATERFLOOD PROJECT	1.650
AK0049379 WESTGOLD	0.000
Electrical Utilities	
(none)	
Offshore Oil & Gas	
AKG283000 GEN. OFFSHORE OIL & GAS BERING SEA	
AKG284000 GEN. OFFSHORE OIL & GAS BEAUFORT SEA	
AKG284100 GEN. OFFSHORE OIL & GAS BEAUFORT II	
AKG285000 GEN. OFFSHORE O&G COOK INLET/GULF OF ALASKA	
AKG287000 GEN. OFFSHORE OIL & GAS NORTON SOUND	
AKG288000 GEN. OFFSHORE OIL & GAS CHUKCHI SEA	
AKG520000 ALASKA SEAFOOD PROCESSORS	

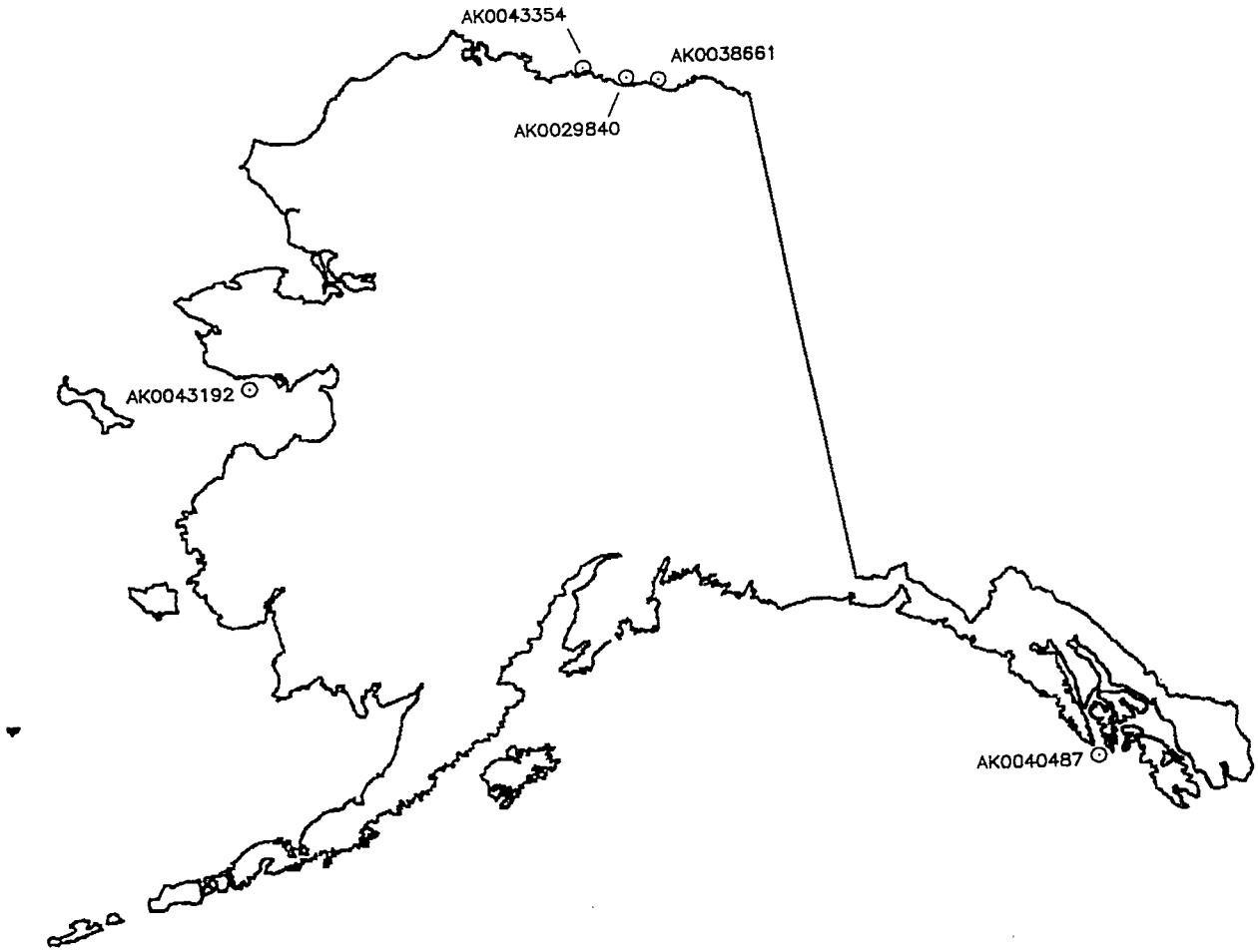


Figure 16. Summary of 403(c) Discharges in Region X (Alaska).

tions under the general permit. These include both mobile and shore-based facilities, and therefore discharges from a single seafood processing source may or may not be subject to 403(c) at any given time, depending on location (see Fact Sheet in Appendix C). As many as 150 additional processors may be covered when the general permit became effective in October 1989. Third, there are currently 30-35 minor individual discharge permits issued to log transfer facilities. Most of these are located in southeast Alaska and their locations with respect to territorial waters is uncertain (see Fact Sheet in Appendix C). Only one facility has been reviewed under 403(c) and Region X is not currently evaluating any of the other log transfer facilities. Fourth, 403(c) criteria have been applied to discharges from two seawater treatment plants operating on Alaska's Beaufort Sea coast. These two permits address seawater treatment plant discharges alone. A third seawater treatment plant is the Endicott Development Project, the only production facility currently permitted on the North Slope. Its permit includes discharges for muds and cuttings as well as seawater treatment and waterflood. Both facilities are associated with waterflood oil-recovery operations (see Fact Sheet in Appendix C). The fifth major category of Alaskan discharges for which the 403(c) regulations may be applicable are the placer (dredging) gold mining operations on Norton Sound. Although there are currently 464 individual NPDES permits for placer mining, only two of these are to marine waters (both at the Westgold facility) and a 403(c) evaluation has been completed for this facility (see Fact Sheet in Appendix C). A few new mining operations may also be subject to 403(c) criteria. Finally, there are over 200 additional discharges to coastal waters in Alaska for which 403(c) eligibility will need to be determined on a case-by-case basis (depending on location with respect to the baseline). These include sewerage systems, heavy construction, petroleum facilities, fish hatcheries, and lead and zinc ore operations.

The Region X coastline is several thousand miles long, extending from 42°N to 68°N. This extensive region encompasses a wide variety of environmental conditions and biological communities. The nearshore area of Oregon and Washington is typically a high-energy, open coastal environment. In contrast, the complex coastline of southeast Alaska encompasses numerous bays, fjords, straits, and channels. Circulation and topography in this area are highly variable and can produce very different discharge impacts. Climatic conditions within the region range from the temperate climate of the northeast Pacific to the ice-covered Beaufort Sea. These diverse physical environments are associated with equally diverse biological communities. Beneficial uses of the receiving waters include navigation, recreation, ocean commercial and sport fishing, and preservation of rare and endangered species (e.g., gray whale) and special aquatic habitats (e.g., wildlife refuges, State parks).

More 403(c) evaluations have been completed in Region X than in any other Region. Based on this experience, Region X reports that the 403(c) regulations encompass all major aspects of ocean discharge assessments and provide the Regions and States with the necessary authority to impose controls. The 403(c) evaluations require a range of multi-disciplinary expertise, and the effort involved in completing an ODCE (although it varies greatly depending on the specific project)

can be extensive. Additional dischargers will require evaluation as baselines are determined for Alaskan waters. If the 403(c) requirements are extended to all marine and estuarine waters, the number of affected facilities in all three States will increase dramatically.

Overview of Regulations for Discharges to Marine Waters

Section 403(c) was enacted as part of the Federal Water Pollution Control Act (FWPCA) of 1972 (the Act). Regulations to implement section 403(c) were promulgated with the ocean dumping regulations on October 15, 1973. EPA's present implementing regulations (the Ocean Discharge Criteria) were promulgated in 1980 at 40 CFR Part 125, Subpart M. While 403(c) contains requirements specific to ocean discharges, it is one part of the overall pollution control strategy under Section 402 of the Act (NPDES). The following discussion provides a perspective on the relationship between section 403(c) and the NPDES program, which is necessary in understanding the future direction of the permit strategy for marine discharges. Other related Federal regulatory programs and policies which will influence the implementation strategy for 403(c), such as 304(l) impaired waterbodies listings, are also discussed.

In 1972, Congress established the basic framework for Federal water pollution control regulation by enacting the FWPCA, now amended and commonly known as the Clean Water Act (CWA), and most recently revised by the Water Quality Act of 1987 (WQA). The framework of the Act, then as now, contemplated a two-pronged approach. First, EPA is to develop national minimum treatment requirements based on an assessment of the achievability of control technologies by individual categories of dischargers. Second, States are to set water quality standards to be used in addition to technology-based controls to achieve water quality objectives for a particular body of water.

Technology-based NPDES Permits

Each effluent limitation in an NPDES permit is established using technology-based or water quality-based standard methodology. Generally, technology-based limits define a floor or minimum level of control and are imposed at the point of discharge, or "end-of-the-pipe." The FWPCA required the application of "best practicable control technology" (BPT) by July 1, 1977, for all NPDES permits. For industry, BPT equates to the "average of the best" waste treatment performance within an industrial category. Subsequent permits for industrial discharges required application of a more stringent level of treatment. For publicly-owned treatment works (POTWs), the Clean Water Act requires effluent limitations based on a secondary treatment level. Pollutants are divided into "conventional" (BOD, TSS, fecal coliform, and oil and grease), "toxic" (65 classes of toxic compounds), and "nonconventional" (ammonia, chlorine, color, iron, total phenols and all other pollutants which are not listed as toxic or conventional).

Currently, dischargers are separated by industry type and further divided into "new" or "existing" sources. Effluent limitations for existing sources are to be based on the "best available technology economically achievable" (BAT) for toxic and nonconventional pollutants, and by the "best conventional pollutant control technology" (BCT) for conventional pollutants. Initially, BAT and BCT limits were required by July 1, 1984, but the WQA extended the deadline to March 31, 1989. Effluent limitations for new sources, "new source performance standards" (NSPS), are to be based on the "best available demonstrated control technology, processes, operating methods, or other alternatives" including, where practicable, no discharge of pollutants. NSPS may be more stringent than BAT or BCT regulations. Where EPA has not promulgated applicable nationwide effluent limitations guidelines, the Clean Water Act authorizes EPA to establish technology-based permitting limitations case-by-case, based on "best professional determination" (BPJ).

Water Quality-based NPDES Permits

In addition to the technology-based limits that are applicable to all sources, the CWA requires that all permittees must comply with any applicable limits derived from additional or more stringent State water quality standards. This strategy builds on BAT by developing effluent limitations for all types of pollutants based on State water quality criteria within State standards (for marine and fresh waters). State water quality standards are made up of State water quality criteria (numeric and narrative), a waterbody designated use, and an antidegradation statement as is mandated for each State under section 303 of the CWA. Water quality standards, and toxic pollutant effluent limitations are intended to maintain receiving water quality at a level sufficient to protect the designated uses established by States for surface waters of the United States.

Pollution control is achieved through criteria and standards by specifying allowable concentrations of pollutants within and at the edge of any applicable mixing zone in the receiving water. Given the magnitude of mixing that is expected to occur, allowable concentrations of pollutants are back-calculated and included in NPDES permits as allowable effluent concentrations. Pollutants are regulated on both a chemical-specific and "whole effluent" basis. In developing pollutant specific controls, criteria and standards are developed individually for a single pollutant (or a closely related class of chemicals), or by parameters such as that for dissolved oxygen. EPA and the states have been concerned that traditional pollutant-specific regulatory approaches control only a limited number of substances; therefore, many water quality standards also address the overall toxicity of wastewater discharges (i.e., whole effluent toxicity). Water quality criteria and standards are developed from laboratory toxicity tests, field studies, and/or epidemiology studies. Standards are designed to protect aquatic life and prevent significant health risks.

Recognizing the need to focus future effort on controlling the discharge of toxics into receiving waters, and especially for nonconventional pollutants and specific toxics for which no specific criteria or

standards exist, EPA published the Federal Register Notice "Development of Water Quality-Based Permit Limitations for Toxic Pollutants: National Policy" (49 FR 9016, March 9, 1984). This policy emphasizes EPA's integrated approach of using both biological and chemical methods for characterizing effluents and developing effluent limits through the NPDES permit program. Under sections 308 and 402 of the CWA, NPDES permittees may be required to monitor discharges to measure pollutants, including toxicity, and to collect receiving water biological data, to assure compliance with state water quality standards. To further support EPA's toxics control program, the Agency also developed two guidance documents: "Technical Support Document for Water Quality-Based Toxics Control" (EPA 440/4-85-032, September 1985) and the "Permit Writer's Guide to Water Quality-Based Permitting for Toxic Pollutants" (EPA 440/4-87-005, July 1987). The Technical Support Document provides a technical explanation of biological and chemical techniques to assess and control toxic pollutants and toxicity. The Permit Writer's Guide gives State and Federal NPDES permit writers a methodology for deriving water quality-based effluent limits. The Technical Support Document is presently being revised.

The national surface water toxics control strategy builds on the BAT base and includes not only pollutant-specific controls (through established criteria and standards) but also control of complex mixtures of pollutants and pollutants which have no specific numeric criteria and standards. This is achieved by treating whole effluent toxicity as a control parameter. Toxicity limitations for complex effluents are developed in conjunction with biological toxicity testing procedures (e.g., whole effluent toxicity tests) which relate the effluent toxicity to an expected receiving water impact and therefore allow evaluation of compliance with the general narrative standard of "no toxics in toxic amounts". If this standard cannot be achieved, a toxicity reduction evaluation (TRE) can be implemented to identify and mitigate sources of effluent toxicity. Chemical, physical, and biological testing conducted by individual discharges are determined on a case-by-case basis. Factors considered in evaluating an individual discharge include the degree of impact, complexity and variability of the effluent, receiving water body characteristics (physical, chemical, biological), potential for human health impact, existing data, level of certainty desired in the water quality assessment, and overlapping impacts from other sources of pollutants.

This dual approach of biological (whole effluent) toxicity and chemical-specific analyses was re-emphasized by Congress in the Water Quality Act (WQA) of 1987. EPA was specifically directed to report to Congress on methods for establishing and measuring water quality criteria for toxic pollutants through the use of biological monitoring and assessment methods in addition to pollutant-by-pollutant analyses.

Recently, EPA promulgated regulations (54 FR 23868, June 2, 1989) to reinforce the Agency's surface water toxics control program, and to interpret Section 308(a) of the WQA, which added section 304(l) to the CWA. Section 304(l) requires States to identify those waters that are adversely affected by toxic, conventional, and nonconventional pollutants, and to prepare individual control strategies that will restrict

point source discharges of toxic pollutants. In the regulations, EPA reiterated that an adequate State regulatory program for developing water quality-based effluent limits in NPDES permits should be an integral part of each approved State's NPDES program. EPA also emphasized that narrative water quality standards (e.g., "no toxics in toxic amounts") have the same force and effect as other State water quality standards, and that these narrative standards must be implemented to achieve the goals of the CWA.

The national surface water toxics control strategy applies to all surface waters of the United States -- both fresh and marine. However, the early development of technical guidance for the water quality-based toxics control strategy has focused on freshwater systems, in part because physical and chemical processes controlling pollutant fate have been more extensively studied in these systems. Guidance was provided on the implementation of EPA's 1984 biomonitoring policy, considering such issues as the development of water quality standards and criteria, effluent characterization, health hazard assessments, wasteload allocations, and permit requirements/compliance monitoring. The whole effluent toxicity approach involved the use of test organisms (using such marine species as *Arbacia punculata* [an echinoderm] and *Mysidopsis bahia* [an arthropod]) exposed to municipal or industrial effluent to measure acute and chronic toxicity.

Other manuals were issued by EPA for use by EPA Regional and State programs and NPDES permittees to establish standardized methods for measuring: for example, (1) the acute toxicity of effluents to freshwater and marine organisms ("Methods For Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms," EPA 600/4-85-013, March 1985), and (2) the chronic toxicity of effluents to freshwater organisms ("Short-Term Methods For Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," EPA 600/4-85-014, December 1985).

An evaluation of the fate of pollutants and potential biological impacts in marine waters, especially for estuaries, usually is more difficult than for freshwaters as a result of: (1) the higher variability and complexity of the marine ecosystem; (2) the lack of approved marine pollutant water quality and sediment criteria; and (3) the importance of both sediment transport and its interaction with the water column. These difficulties are being addressed by EPA guidance for determining marine water quality and biological impacts, and the NPDES water quality-based permit limitations. The 1987 permit writer's guide (EPA 440/4-87-005, July 1987) is designed to assist State and Federal NPDES permit writers in the development of water quality-based permit limits for pollutants. In addition, as an adjunct to EPA's 1985 manual for determining acute toxicity of effluents to marine waters, EPA in 1988 released standardized methods for estimating the chronic toxicity of effluents to marine and estuarine organisms ("Short-Term Methods For Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms," EPA 600/4-87-028, May 1988).

EPA is continuing its efforts to refine and further develop guidance to assess effluent toxicity and receiving water quality. *In situ* biomonitoring methods, already well established for freshwater systems, are being

modified to monitor long-term trends of marine impacts. As the Agency proceeds to develop water quality and sediment criteria, EPA is considering such factors as: durations of exposures and allowable frequencies of exceedance to limit acute and chronic biological effects. EPA is providing guidance for States in their development of water quality standards, and NPDES effluent permit limitations. In addition, EPA is developing a Marine/Estuarine Permit Writer's Guide and an Estuary Waste Load Allocation Assessment Guidance Document. EPA's future endeavors will be geared not only to developing pollutant specific NPDES permit limits, but also to the development of effluent toxicity limitations. The Marine/Estuarine Complex Effluent Toxicity Testing Program is currently used to provide technical support in the development of NPDES permits. NPDES dischargers would be required, where necessary, to conduct a toxicity reduction evaluation (TRE) to localize effluent toxicity sources and identify control options, and, if necessary, implement a toxics control program in order to bring them back into compliance with their permits.

403(c) Relationship to Other Programs

301(h) for POTWs

Section 301(h) of the Act provides that the Administrator, with the concurrence of the State, may issue a NPDES permit for a POTW which waives the secondary treatment requirements for POTW discharges into certain ocean or estuarine waters. POTWs requesting a section 301(h) "waiver" must adequately demonstrate that the integrity of the marine receiving waters, and biota, will not be impaired. Applicants for a 301(h) "waiver" are required to collect data and perform an analysis on their discharge in consideration of:

- Compliance with State water quality standards and marine water quality criteria;
- Near- and farfield transport of pollutants in the water column and sediments;
- Protection and propagation of balanced indigenous populations of fish, shellfish, and wildlife, including consideration of:
  - commercial and recreational fisheries
  - distinctive habitats of limited distribution
  - bioaccumulation of toxic substances (including consumption of contaminated seafood by humans);
- Protection of public water supplies and allows recreational activities in and on the water;
- Toxic substances control:
  - industrial pretreatment program
  - nonindustrial source control program;
- Data analysis and monitoring programs:
  - effluent, water quality, and biological monitoring.

The 301(h) regulatory requirements summarized above are similar to the 403(c) Ocean Discharge Criteria in the emphasis on evaluating the

impact of a discharge on the marine biological community at risk. In addition to compliance with water quality standards (a requirement for every NPDES permit), both programs stress consideration of special aquatic habitats, impacts on the local and surrounding biological communities, and bioaccumulation of toxic substances available to demersal fishes and shellfish through contact with contaminated sediments. The Agency policy is to presume that discharges that have received a 301(h) waiver will not cause unreasonable degradation with respect to those pollutants and conditions covered by the waiver.

There were 208 waiver applications submitted by POTWs by the statutory deadline resulting in 48 waiver approvals and 15 determinations yet to be made. The remaining applications were denied by the EPA or withdrawn by the applicant. Because the potential for environmental impact from a "less-than-secondary" POTW is relatively greater compared to that from a "secondary" POTW, the 301(h) waivers typically require extensive analysis of *in situ* physical, chemical, and biological conditions. Extensive technical guidance on risk assessment procedures and monitoring techniques for ocean discharges has been developed by EPA to implement the 301(h) program, including bioaccumulation monitoring methods, fish histopathology methods, analytical methods for priority pollutants and pesticides in marine sediments, and quality assurance/quality control (QA/QC) procedures. EPA will consider the use of these technical guidance and tools, where appropriate, in the implementation of the 403(c) program.

Pretreatment Programs

The Clean Water Act authorized EPA to establish effluent limitation guidelines for existing direct sources, standards of performance for new direct discharge sources, and pretreatment standards for new and existing "indirect" discharges to POTWs. Regulations were promulgated by EPA to require pollutant dischargers to comply with effluent guidelines and standards (40 CFR Part 401). Under 40 CFR Part 403 ("General Pretreatment Regulations for Existing and New Sources of Pollution"), EPA established:

(1) general prohibitions to prevent the release of any pollutant from any non-domestic source into Publicly Owned Treatment Works (POTWs) which interfered with, passed through untreated, or was otherwise incompatible with the POTW, and

(2) specific prohibitions against the introduction of pollutants from any non-domestic source into a POTW which could cause a fire/explosion hazard, corrosive (pH) damage, or interference with the POTW, due to obstruction of flow, heat, or other reasons.

In addition, EPA established national categorical pretreatment standards applicable to specific industrial subcategories (40 CFR 403.6; 406-471), and required POTWs to develop specific local limits. Local discharge limits could be set by industrial category, by specific pollutant, or by individual industrial facility once industrial discharges were identified which: contained toxic priority pollutants or prohibited discharges (i.e., heat, explosive/fire hazards, corrosive agents), interfered with POTW operations, passed through the POTW treatment

system and adversely affected receiving water quality, contaminated POTW sludge, or created a health/safety hazard for workers in the POTW. The local limits developed are deemed to be Federal standards for the purposes of the prohibition under section 307 of the Clean Water Act against violating pretreatment standards, and thus are considered to be Federally enforceable.

The categorical pretreatment standards developed by EPA regulate pollutants commonly discharged by specific industrial categories. The categorical industries must comply with technology-based effluent limitations and monitor discharges to achieve and maintain compliance with the standards. Federal categorical standards therefore provided a minimum, uniform level of pollution control of all dischargers in similar industrial categories.

Therefore, for categorical industries, pretreatment standards could consist of a combination of prohibited discharge standards, Federal categorical pretreatment standards, and local pretreatment limits. The more stringent of the discharge limits would apply. For non-categorical industries, pretreatment standards could consist of prohibited discharge standards and local discharge limits.

Since the majority of 403(c) land-based discharges are POTWs, these POTWs, to limit the degradation of receiving waters (as required under Clean Water Act section 403(c)), must ensure that their pretreatment programs are effectively implemented and enforced so as to prevent violations of the POTWs' NPDES permit conditions.

Section 316 (a),(b) for Cooling Discharges and 301(g) Variances for Nonconventional Pollutants

Section 316 of the Act provides for waivers from the effluent limitation for the control of the thermal component of discharges from electric utilities and other facilities. These discharges typically involve the passage of large volumes of flow through condenser systems, where the primary impacts are related to temperature differences and physical passage of marine organisms through the cooling systems. Section 301(g) of the CWA provides a waiver from BAT for several named pollutants. Compliance with sections 301(g) and 316 may be used to presume compliance with 403(c) in some cases, with respect to those pollutants and conditions addressed in the waivers.

National Environmental Policy Act (NEPA)

In issuing new source NPDES permits, EPA prepares an environmental impact statement (EIS) under NEPA, if the permitted discharge would significantly affect the quality of the human environment. (If not, the Agency prepares an environmental assessment and Findings of No Significant Impact.) The NEPA process can be used to provide

data and information with which to make the necessary 403(c) determinations (and vice versa). However, under section 511 of the CWA, the NEPA process does not substitute for or override requirements of section 403(c).

Section 304(l) for Impaired Waterbodies

An important part of the 1987 Amendments to the Clean Water Act is the identification of impaired waterbodies and identification and control of point sources causing water quality impairment due to toxic pollutants. Section 304(l) requires EPA to identify and categorize the nation's impaired waterways on three lists. To briefly summarize these lists; the "Long List" includes all impaired waterbodies where such impairment is caused by point or nonpoint sources, or is due to conventional, nonconventional, or toxic pollutants. The "Mini List" is a subset of the Long List and includes those waterbodies where numeric criteria within state water quality standards for section 307(a) priority pollutants are expected to be exceeded. The "Short List" is that subset of the Long List (with some overlap of the Mini List) where water quality impairment is due entirely or substantially to point source discharges of section 307(a) pollutants. *(NOTE: Section 307(a) of the Clean Water Act, entitled "Toxic and Pretreatment Effluent Standards," refers to a list of toxic pollutants subject to the Act. EPA has identified one hundred twenty-six of these organic and inorganic individual chemicals and compounds as "priority pollutants.")* Finally, for each waterbody on the Short List, the sources of section 307(a) toxic pollutants causing impairment must be identified as well as the amounts of each pollutant discharged.

Facilities which are "entirely or substantially" causing or contributing to the impairment of waterbodies on the Short List will be required to develop additional controls on priority pollutants through individual control strategies. These controls will be established as enforceable effluent limits in the discharger's NPDES permit. There are no 403(c) ocean dischargers affected by section 304(l) requirements. For those discharges located in waterbodies on the Short List, high priority will be given to evaluating and controlling priority pollutants.

It should be noted that section 304(l) control strategy requirements are to be completed by June 1990 with full compliance with individual control strategies by June 1992 or June 1993. After these dates, section 304(l) requirements will no longer apply. Therefore, steps to continue the process established by section 304(l) are being taken by focusing on the implementation of section 303(d). Section 303(d) requires that States identify and prioritize water quality-limited segments (any segment where water quality does not meet applicable water quality standards [40 CFR Part 130.2(i)]) needing total maximum daily load (TMDL) determinations necessary to implement applicable water quality standards.

EPA's final regulations (54 FR 23868, June 2, 1989) are designed to satisfy the requirements of Section 304(l) of the CWA. These regulations established minimum consistent procedures for States and EPA to develop and implement water quality-based NPDES permit limits.

The permitting authority must establish appropriate chemical-specific effluent limits, or whole effluent toxicity limits for pollutants, if the discharges of the pollutants cause, or have the reasonable potential to cause, excursions above water quality criteria (including narrative water quality criteria).

EPA's National Coastal and Marine Policy

In January, 1989 EPA issued its National Coastal and Marine Policy for the protection, restoration, and maintenance of the Nation's coastal and marine waters. The goals of this EPA policy are summarized below:

- Recovery of full recreational use of shores, beaches, and water by reducing sources of bacterial and other contamination, plastics, floatables, and debris.
- Restoration of the Nation's shellfisheries and salt-water fisheries and protection of marine mammals and living resources by controlling pollution and causes of habitat degradation and loss.
- Minimize the use of coastal and marine waters for waste disposal by strictly limiting ocean dumping, tightening controls on land-based sources, and establishing aggressive programs to reduce the amount of waste generated by our society.
- Greater understanding of the effects of pollution on complex coastal and marine ecosystems by expanding scientific research and monitoring programs, and the development of new technology.
- Leadership by the United States in protection of the world's oceans by aggressively promoting international efforts to stop pollution and protect critical marine habitats and living resources.

The implementation of the policy to achieve these goals includes increased focus on the control of both offshore and landbased point sources through analysis of impacts to the marine community, revision of NPDES permits where necessary, enforcement of NPDES permit conditions, evaluation of alternatives to ocean disposal, and monitoring of living resources to ensure that permits are protective. This policy is both consistent with and supportive of the regulations under section 403(c).

403(c) Implementation Plan / Schedule

This section of the report outlines the Agency's plan for further implementation of section 403(c) ocean discharge criteria regulations. This plan reflects the evolving nature of the NPDES permit program for marine discharges, and improved incorporation of the 403(c) guidelines into the permitting process. The plan is accompanied by an implementation schedule and an estimate of resources required to meet this schedule for FY 1990 and 1991, consistent with the President's budget. The success of the plan depends on 1) the extent to which science develops to establish a cause and effect relationship between discharges and the marine environment, 2) the extent to which there is information to address the ocean discharge criteria, 3) the resources that the Agency and NPDES authorized states are able to commit to the reviews, permit writing, and analysis of data generated from monitoring requirements in the permits, 4) the development of methods for sediment and biological criteria for marine receiving waters, and 5) national technical guidance.

One of the greatest barriers to implementing a national 403(c) review program has been the cost of performing 403(c) reviews at the Regional or State level, and monitoring and providing guidance for State activities where States are the approved NPDES permitting authority. Also, ocean discharge criteria evaluations are often complex analyses that do not lend themselves easily to quantification of specific limits or engineering techniques. Reviews under section 403(c) typically require a range of multi-disciplinary talent, including physical oceanography, systems modeling, marine biology/toxicology, marine monitoring, and environmental engineering.

Next Reissuance 403(c) Permit Review Procedures

The NPDES permit program is based on a five year cycle. As permits expire, NPDES permit applicants will be required to submit all available information pertinent to section 403(c) using information available from any existing monitoring data, literature reviews and other information as required by the Agency. In addition to an evaluation of water quality-based elements, normally required under the NPDES program, the Agency will use the information submitted by the applicant to evaluate the potential effects of the discharge vis-a-vis the 10 ocean discharge guidelines.

The Agency will evaluate the information base submitted by the applicant and make a determination of unreasonable degradation as specified in the regulations [40 CFR Part 125.122 (a)], to the extent that resources will allow. The Agency anticipates that during the next round of permitting there will be insufficient data to fully describe the

impact of the discharge on the biocommunity for some applicants. Thus, it is likely that for some dischargers a determination of the existence of reasonable or unreasonable degradation will not be possible due to insufficient information. Consequently, the Agency expects that many reissued permits will be, as they have been in the past, issued on the basis of no "irreparable harm."

The focus of the reissuance of permits is on the monitoring requirements in the permit. As a permit requirement under 403(c), the permittee may be required to perform *in situ* monitoring of the receiving water, as well as the water quality-based monitoring currently required. The objective of *in situ* and other monitoring requirements is to collect data, whenever practicable, for the subsequent round of permitting when a determination will be made on unreasonable degradation and to ensure no irreparable harm during the term of the permit.

The applicant will collect data and perform analyses for the needed technical evaluations as specified in the permit. The Office of Marine and Estuarine Protection will begin to develop technical and procedural guidance specific to 403(c) in FY90. The 403(c) program will also draw on the experiences of other programs as it does presently. Specific criteria for the ocean discharge guidelines will be provided in the revised regulations, as well as more detailed technical guidance on analytical methods and monitoring.

NPDES permits will be issued for a period of five years unless conditions exist such that the permitting Agency believes a shorter time frame is warranted. This may include cases of discharges into stressed waters, sensitive areas, or when the toxicity or flow rate of the discharge is of concern. In these instances, the permitting Agency may impose conditions protective of the ecosystem in addition to the monitoring requirements.

Monitoring data can be evaluated at any point during the permit cycle. Permits based on no irreparable harm will have a reopener clause so that if the original determination is incorrect, further evaluation can be conducted. Such cases might involve discharges into or near sensitive or critical habitats or stressed waters, discharges that exhibit high mass emission rates of priority pollutants or other toxic substances, or discharges where threats to public health are suspected or have been observed.

Subsequent Round 403(c) Permit Review Procedures

In the subsequent round of permitting, each permit applicant will be required to readdress the ocean discharge criteria before the permit is reissued. This application will focus on effluent characteristics and impacts, or potential effects, on the biocommunity. Again, as in the previous round, applications will be reviewed using the 403(c) guidelines. The difference in this round will be that for many cases the data used to make the evaluation will not only include generalized

scientific information from the literature, but will also include the data specific to the permitted discharge, collected from monitoring required under the previous permit which was specifically designed to evaluate the 403(c) guidelines. The EPA or State (NPDES approved) will review the data and make a determination whether there is unreasonable degradation of the marine environment. If it is determined that the discharge will not cause unreasonable degradation, a permit will be issued with new or modified monitoring requirements. Dischargers for which irreparable harm is observed will be required to either use an alternative disposal method or install pollution reduction technologies.

Data submitted in support of NPDES permit applications may be reviewed with varying attention to detail. A minimum review typically involves simple comparisons of the applicant's technical results and conclusions with applicable criteria and standards. More comprehensive reviews may examine:

- The appropriateness of the assumptions inherent in the design and execution of the technical studies;
- The adequacy of the study design for demonstrating compliance with permit specifications;
- The quality of the data that can be expected given the field and laboratory procedures that were implemented;
- The validity of the applicant's results and conclusions;
- The ability of the applicant's data to demonstrate compliance with applicable statutes and regulations.

Resource Requirements for Achieving Compliance with Section 403(c)

To estimate the resources needed by EPA headquarters and Regional offices, only those elements that are not included in the permitting process and that result directly from section 403(c) requirements are factored into the calculation. The following simplifying assumptions have been made:

1. Applicants for a permit to discharge beyond the baseline, whether new or a renewal, will be required to submit information that will be used to evaluate the discharge in context of the ten ocean discharge criteria.
2. Both major and minor dischargers will be evaluated. [Present Agency resources necessitate that most minor permits continue in effect under an administrative order.]
3. All dischargers to the ocean whose permits are continued under an administrative order will be evaluated at some time during the next five years.
4. To oversee permits written by an NPDES delegated State, the Agency (Region) will incur costs of about 25 percent of the State's cost for each permit. The Regions have estimated between 10 and

25% for oversight. For purposes of this report, 25% was chosen. This higher estimate was chosen because some Regions are less practiced in 403(c) oversight than others and may initially require more time and resources. Additionally, some of the evaluations that are more complex may require significant resources beyond those usually allocated to oversight.

5. Until FY94 the major tasks of the Regions and NPDES authorized States, will be to review monitoring data from existing permits and permit applications and to develop monitoring requirements as conditions of the next permit. The depth of the Ocean Discharge Criteria review will vary with the complexity of the discharge and the type of near and far field biological communities the discharge will be expected to affect. A general assumption has been made that for the next round of permits, readily available information and existing monitoring data will suffice, in most cases, to determine whether or not irreparable harm will occur.

6. For a small number of permits (10%), it is assumed that monitoring and modeling by the Agency will be required before a determination of unreasonable degradation or irreparable harm. Cases in which this collection of additional *in situ* data may be necessary include:

   - Discharges near sensitive habitats (e.g., coral reefs), particularly if those habitats are limited in distribution;
   - Discharges near habitats critical for the survival and reproduction of threatened or endangered species (e.g., seagrass beds);
   - Discharges into or near spawning grounds (e.g., offshore gravel beds), nursery grounds (e.g., mangrove swamps), major commercial or recreational fishing areas, or marine sanctuaries;
   - Large discharges into coastal receiving environments that are not influenced by other point or nonpoint sources of pollutants (thus allowing cause and effect relationships to be more readily evaluated based on *in situ* data);
   - Discharges that exhibit high mass emission rates of priority pollutants or other toxic substances;
   - Discharges where threats to public health (e.g., from contact with pathogens in the water, from the consumption of contaminated fish or shellfish) are suspected or have been observed;
   - Discharges where degradation of the shoreline (e.g., organic matter washed up on beaches) are suspected or have been observed.
   - Proposed new discharges.

   In these cases, the permit may be issued for a shorter time period than five years, or more frequent data evaluations may be warranted.

7. The subsequent round of permitting will require ODC data with the permit renewal application. EPA, or its authorized agency, will review the data and develop its ODCE accordingly. The revised ODCE will contain the analysis of the monitoring data

collected during the permitting period. The effort to review the data is expected to be more resource intensive (an increase of 100% level of effort is estimated) than in the previous round. New, reduced, or modified monitoring requirements will be added to the permit based on the review of data.

Table 10 lists some of the effluent characterization, receiving water quality, and biocommunity impact analyses which may be required to determine unreasonable degradation. This is not a complete list and the Agency is working to develop marine methods and criteria to support 403(c) determinations, especially for sediment quality and biological resource issues.

8. The procedure for issuing general NPDES permits will be unchanged. The Agency's cost to prepare an ODCE for general permits has ranged from 750 professional hours each for several Alaska oil and gas general permits, to 4000 hours for the southern California offshore oil and gas permit. Because general permits typically involve large ocean regions and numerous actual (or potential) discharge locations, the approach necessarily has relied on the assumption that observed or predicted effects for a few sites can be extrapolated to many other (similar) sites. This approach has been used by the Agency to develop general permits for the offshore oil and gas and seafood processing industries, which can involve hundreds of similar, widespread activities.
9. Compliance costs are subsumed in the existing NPDES program. Additional enforcement costs for administrative orders, administrative penalty orders, and litigation will accrue to the 403(c) program.

The following is a summary of the resources which EPA's headquarters, Regional offices, and the States need to continue to implement the 403(c) program in FY 1990 and 1991. As discussed elsewhere in this Report, a 403(c) evaluation increases the resources used by the permitting Agency above those for issuing an NPDES water quality or technology based permit. This is due to the effort to analyze the information base, evaluate the data, and produce an ODCE. Also, in some cases (we have estimated 10% based on past experience), the Agency finds it necessary to run models or to perform monitoring to corroborate or supplement information provided by the applicant. In the analyses of the Ocean Discharge Criteria, the Agency must also decide the type and frequency of monitoring to be included as part of the permit conditions to assure that the discharge, in fact, causes "no unreasonable degradation." The data generated by the monitoring requirements are then analyzed and evaluated in preparation for use in permit renewal.

Table 11 presents the Agency's estimates of Regional (EPA) resource requirements for implementing the 403(c) program. Figure 17 presents estimates of the Regional resources that will be required to implement section 403(c) each year.

Contract oversight is the time allocated by an Agency representative to oversee a task which is contracted out. This is calculated as 25% of the contract amount ($) converted into level of effort, or hours. For estimations in this report we assume an average contract cost of $60/hour. For example, a $700,000 contract, divided by $60/hour, is

Table 10: Potential Analyses to Determine Unreasonable Degradation under 403(c)

WATER QUALITY
- Diffuser Hydraulic Check
- Initial Dilution
- Farfield Dilution
- Concentrations of Dissolved Oxygen, Suspended Solids, and pH in Receiving Environment
- Sediment Oxygen Demand
- Sediment Oxygen Demand Following Sediment Resuspension
- Concentrations of Toxic Substances in Receiving Environment
- Light Transmittance
- Aesthetic Considerations (Color, Odor, Slicks, etc.)
- Fecal Coliform/Enterococci Bacterial Concentrations

SEDIMENT QUALITY
- Conventional Sediment Characteristics (e.g., Grain Size, Organic Content, Redox Potential)
- Sediment Transport, Deposition, and Resuspension
- Organic and Total Sediment Deposition
- Deposition of Toxic Substances Associated with Particulates
- Behavior of Settled Effluent Particles in Near Surface Sediments
- Concentrations of Toxic Substances in the Sediments

SENSITIVE HABITATS
- Presence of Sensitive Habitats (e.g., Coral Reefs, Seagrass Beds, Kelp Forest)
- Presence of Habitats Critical for Threatened or Endangered Species
- Potential for Impacts to Sensitive and Critical Habitats
- Potential for Impacts to Threatened or Endangered Species

BIOLOGICAL RESOURCES
- Commercial and Recreational Fisheries
- Benthic Infaunal Communities
- Demersal Fish and Megainvertebrate Communities
- Pelagic Fish Communities
- Plankton Communities
- Sea Surface Microlayer
- Microbial Contamination

AQUATIC TOXICOLOGY
- Bioaccumulation of Toxic Substances
- Acute and Chronic Toxicity
- Histopathology
- Toxicant Transport and Fate
- Ecological Risk Assessment
- Regulatory Toxicology

PUBLIC HEALTH
- Pathogens Affecting Water-Contact Activities
- Pathogens Affecting Consumption of Fish and Shellfish
- Health Risk Assessment of Chemically Contaminated Aquatic Organisms
- Health Risk Assessment for Chemical Contaminants in Sediment and Water

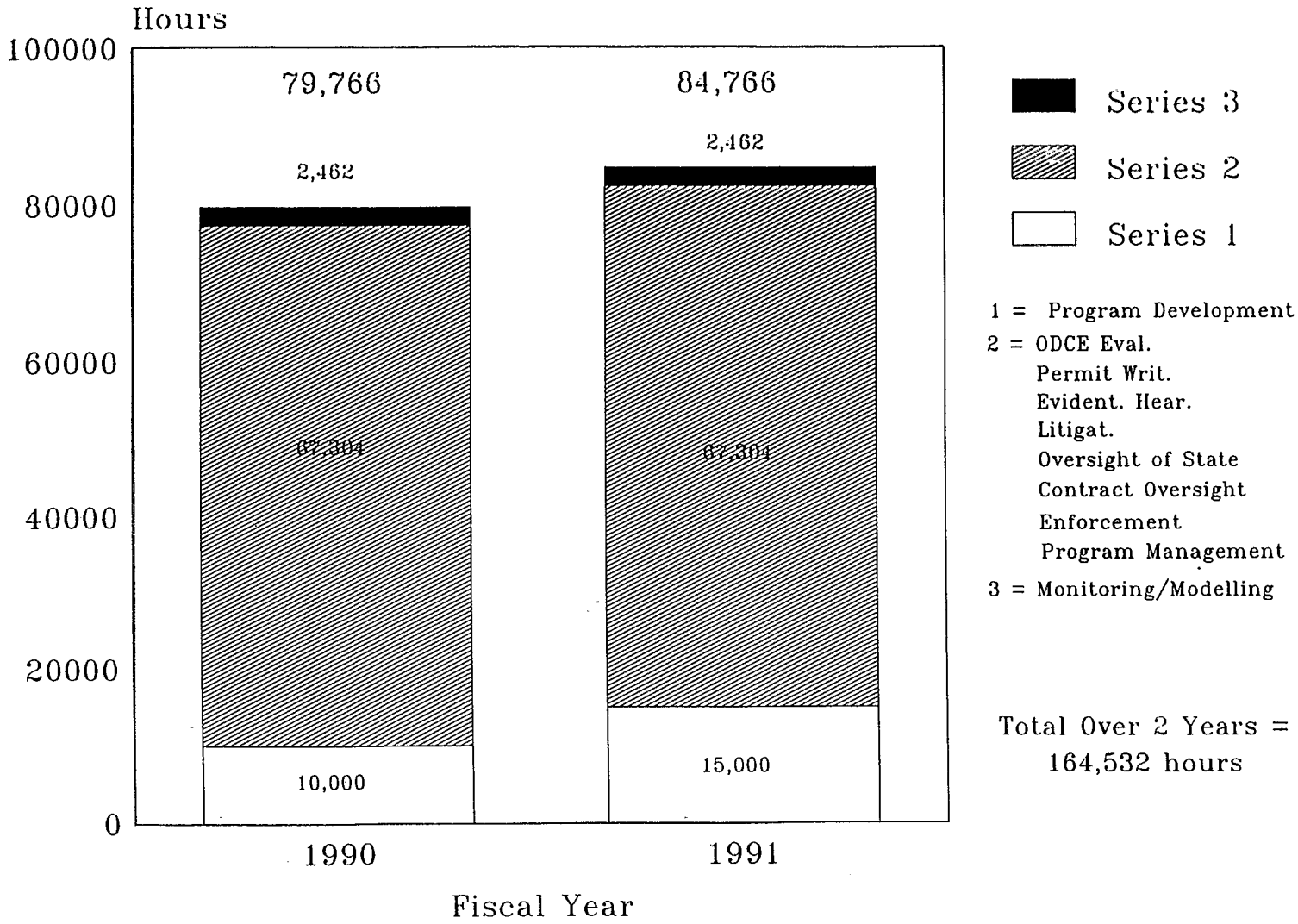
Table 11. Summary of EPA Resources (in hours) Needed to Implement the 403(c) Program in FY 1990 and FY 1991

The calculations for this table are based on the following:

Large discharger in a state not approved for NPDES program (LNA) = 76
Small discharger in a state not approved for NPDES program (SNA) = 96
Large discharger in a state approved for the NPDES program (LA) = 55
Small discharger in a state approved for the NPDES program (SA) = 25

ITEM	PRICING FACTOR (hrs./item)	HOURS FY 1990	HOURS FY 1991	SUBTOTALS
ODC Evaluations				
#LNA	200	3,040	3,040	
#SNA	100	1,920	1,920	
#LA	50	550	550	
#SA	25	480	480	11,980
Monitoring/Modeling				
a. Review data for active permit				
#LNA	80	1,220	1,220	
#SNA	40	770	770	
b. Review data for active permit (FY94)				
#LNA	160	--	--	
#SNA	80	--	--	
c. Additional monitoring/modelling				
.10 (#LNA)	120	192	192	
.10 (#SNA)	60	120	120	
d. Reopeners				
.10 (#LNA)	40	160	160	4,924
Permit Writing				
#LNA	40	608	608	
#SNA	520	9,984	9,984	21,184
Evidentiary Hearings				
.70 (#LNA)	2,000	22,400	22,400	
.70 (#SNA)	1,200	16,800	16,800	78,400
Oversight of State Programs				
#LA	50	550	550	
#SA	25	480	480	2,060
Contract Oversight				
.25 (n/60), where n = total contract dollars		5,400	5,400	10,800
Enforcement				
Administrative Orders				
.50 (.10 (#LNA)	240	240	240	
.50 (.10 (#SNA)	240	192	192	
APOs				
.50 (.10 (#LNA)	500	500	500	
.40 (.10 (#SNA)	500	400	400	
Litigation				
.05 (#LNA)	1,760	1,760	1,760	6,184
Program Management		2,000	2,000	4,000
Program Development		10,000	15,000	25,000
Total		79,766	84,766	164,532

Figure 17. Estimates of Regional Resources Required to Implement 403(c) in FY 1990 and FY 1991



approximately 12,000 hours, and 25% of that 12,000 hours is 3000. Therefore, 3000 hours are needed to manage a $700,000 contract.

Monitoring and modeling includes three areas:

a. Review and evaluate monitoring data during term of active permit (80 hours/large permit and 40 hours/small permit).

b. Reopeners and modification to permits that are in existence. All 403(c) NPDES permits must have a reopener clause (40 CFR 125.123(d)). This clause gives the Agency the explicit legal right to reopen and change conditions of a permit, given cause, while the permit is still in effect. The estimates for this item are made on the assumption that 10% of the large permits will be reopened and that this will require and additional 40 hours each.

c. Additional monitoring/modeling. This includes the Agency's cost to run models or require monitoring to verify data submitted by the applicant or to determine possible effects of a discharge. This is in addition to information submitted by the applicant.

Over the next five years, the 403(c) program will concentrate on program development which includes developing and refining analytical methods, monitoring methods, and writing guidance for the permit writers and for the owners and operators of the facilities subject to 403(c) reviews and requirements. Finally, program development includes training in EPA Regions and States.

The primary function of EPA Headquarters in the 403(c) program will be to provide policy and guidance on the 403(c) program. Included in this will be:

- Policy guidance for general permits;
- Policy guidance for individual permits;
- An inventory and critical assessment of available biomonitoring and ecosystem monitoring and assessment methods;
- Plan of research program needs to support 403(c) implementation;
- Technical documents
  - analytic methods
  - monitoring strategies;
- Specific criteria for each of the ten 403(c) guidelines;
- 403(c) training for the State and Regional permit writers;
- Guidance Manual on 403(c) for the applicant.

The States which are authorized by EPA to carry out the NPDES permit program will incur a comparable cost for 403(c) reviews to that of the Regions for individual permits.

Implementation Activities

During the early stages (FY90-92) of this implementation period, the Agency plans to conduct a number of activities necessary to ensure

compliance with 403(c) regulations. These activities are currently underway and consist of:

1. Completion of the 403(c) discharge inventory, including:
   a. Base line determinations where necessary
   b. Update of permit status
2. Completion of the 403(c) procedural guidance manual;
3. Development of a technical guidance document on acceptable analytical methods for 403(c);
4. Development of a long term plan for 403(c) permit review procedures, including:
   a. Integrated review procedures
   b. Incorporation of new criteria
   c. Incorporation of technological advancements
   d. Identification of research needs

Future Efforts: Integration of 403(c) and Water Quality-Based Toxics Control Approach

The future of the 403(c) implementation approach involves integrating the present 403(c) procedures into the evolving water quality-based toxics control approach for marine waters. Most of the 403(c) guidelines which address effluent pollutant characteristics, pollutant fate and transport, and biological and human health impacts are included within the general framework of the water quality-based approach.

The current water quality-based toxics control approach for marine waters focuses primarily on achieving compliance with State water quality criteria and standards by specifying allowable concentrations of pollutants within and at the edge of a mixing zone in the receiving water. The approach includes both chemical-specific controls (through established criteria and standards) and control of complex mixtures of chemicals and chemicals which have no applicable criteria and standards, by treating effluent toxicity as a control parameter (see "Technical Support Document for Water Quality-based Toxics Control," EPA 440/4-85-032, September, 1985).

This water quality-based approach provides a means for deriving NPDES discharge limits, while ensuring protection of receiving waters and compliance with water quality criteria and standards. While the current water quality-based toxics control approach emphasizes effluent testing and water quality criteria and standards, flexibility also exists in the approach to address the 403(c) concerns involving *in situ* biological impacts, by site-specific conditions. Such conditions could include, for example, the proximity of a discharge to sensitive ecological zones (e.g., seagrass beds, marine sanctuaries, etc.), the existence

of known observed biological stress based on available baseline data for the area, or discharges that have high mass emission rates of priority pollutants and other toxic substances. For these situations, additional requirements including, for example, *in situ* sediment toxicity tests, benthic bioaccumulation tests, and benthic biota surveys would be included in the discharge permit review. Guidance on these technical analyses would be integrated into the water quality-based approach from the 403(c) program. Certain specific criteria are unique to 403(c), including determination of unreasonable degradation, irreparable harm, and no reasonable alternatives. These specific criteria would be added to the water quality-based approach to complete the integration of these two programs.

Findings and Conclusions

The inventory conducted for this report identified 323 "definite" dischargers and 217 "potential" dischargers subject to section 403(c) requirements under individual NPDES permits (not including general permits). The status of the potential discharges is pending on a case-by-case establishment of the location of these discharges with respect to the baseline of the territorial seas. (Section 403(c) reviews apply only to dischargers outside the baseline.) The final determination of the location of the baseline rests with the State Department. The Agency continues to work with the State Department to delineate the baseline in order to ensure that section 403(c) implementation is complete.

Although most dischargers outside the baseline are in compliance with section 403(c), the detail and extent of the review, the effectiveness of the monitoring programs, and the amount of review performed after the permits are issued has varied by Region, State, and discharge. The Regions and States need procedural and technical guidance to assist in their review of information and development of Ocean Discharge Criteria Evaluations. In addition, guidance is needed to assist in translating the monitoring recommendations developed in the ODCE into enforceable conditions in a permit. Separate procedural and technical guidance is needed by the dischargers to prepare the ODCE and the permit application.

Equally significant barriers to effective implementation are the present limitations of science to adequately address the complex issues of biological impacts and toxicity assessments in the marine environment. There is much that needs to be learned about environmental effects-based monitoring and assessment of the monitoring data. Criteria and standards for marine water quality and sediments are limited but are being addressed by the Agency. Environmental effects-based tests for marine organisms need further review and approval for inclusion in the 403(c) technical and procedural guidance.

The Agency has developed a two-phase strategy to ensure a more consistent implementation of section 403(c). This two-phase strategy will, over the next two rounds of permitting, provide the maximum level of environmental protection possible given the programmatic, scientific, and resource limitations. As part of the implementation strategy, the Agency plans a number of supporting activities to ensure effective 403(c) implementation. These activities include development of national technical and procedural guidance, incorporation of new technological advances and criteria, and integration of 403(c) procedures into the Agency's evolving water quality-based toxics control approach for marine waters.

The Agency believes that current statutory authority [section 403(c)] is adequate to establish regulations for wastewater dischargers that are protective of the marine environment. Pursuant to section 403(c) of the

Clean Water Act, the Ocean Discharge Criteria regulations were promulgated in the Federal Register in 1980 and later codified in 40 Code of Federal Regulations (CFR) Section 125.120-124. These regulations established guidelines to make a determination whether a discharge is causing "unreasonable degradation" to the environment. Despite the breadth of the Ocean Discharge Criteria Regulations, effective implementation has been further limited by the lack of technical and procedural guidance for making determinations of "no unreasonable degradation, "no irreparable harm," and "no reasonable alternatives to on-site disposal."

The Agency has activities underway and others under development which are designed to increase the level of implementation of section 403(c). The Agency does not recommend statutory revisions to section 403 of the CWA. The Agency will continue to work on the implementation activities as described in this report and focus its resources in those areas.

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Appendix A

Acronyms Used in This Report

API	American Petroleum Institute
BACT	Best Available Control and Treatment Technology
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Technology
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Determination
BPT	Best Practicable Technology
CHP	Chlorinated Hydrocarbons other than PCBs
COD	Chemical Oxygen Demand
CWA	Clean Water Act
CZMP	Coastal Zone Management Plan
DO	Dissolved Oxygen
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FCB	Fecal Coliform Bacteria
FTE	Full Time Equivalent
FWPCA	Federal Water Pollution Control Act
LOE	Level of Effort
LOOP	Louisiana Offshore Oil Port
MGD	Million Gallons Per Day
MMS	Minerals Management Service
NCPDI	National Coastal Pollutant Discharge Inventory
NEPA	National Environmental Policy Act
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
ODBA	Ocean Dumping Ban Act
ODCE	Ocean Discharge Criteria Evaluation
ODES	Ocean Data Evaluation System
OW	Office of Water (EPA)
OWEP	Office of Water Enforcement and Permits (EPA)
OWRS	Office of Water Regulations and Standards (EPA)
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCS	Permit Compliance System
Pet HCs	Petroleum Hydrocarbons
POTW	Publicly Owned Treatment Works
QA	Quality Assurance
QC	Quality Control
SIC	Standard Industrial Classification
STP	Seawater Treatment Plant
TCP	Toxics Control Program
TN	Total Nitrogen
TP	Total Phosphorus
TRE	Toxicity Reduction Evaluation
TSS	Total Suspended Solids
WQA	Water Quality Act of 1987
WQC	Water Quality Criteria
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant

Appendix B

Glossary

Acute - involving a stimulus severe enough to rapidly induce a response; in marine and aquatic toxicity tests, a response observed in 96 hours or less typically is considered acute. An acute effect is not always measured in terms of lethality; it can measure a variety of effects. Note that acute means "short", not mortality.

Average daily discharge limitation - the highest allowable average of pollutant concentrations over a 24-hour period, calculated as the sum of all pollutant concentrations measured divided by the number of pollutant concentrations measured that day.

Average monthly discharge limitation - the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of discharges measured that month.

Baseline - defines the landward boundary of the territorial seas.

Best professional determination (BPJ) - a permit writer's best determination, reflected in permit limits developed on a case-by-case industry-specific basis, as to the control techniques to be used to limit wastewater discharges, after consideration of pertinent information which forms the basis for the terms and conditions of a permit.

Bioaccumulation - uptake and retention of substances by an organism from its surrounding medium and from food.

Bioassay - a test used to evaluate the relative potency of a substance by comparing its effect on a living organism with the effect of a standard preparation on the same type of organism.

Bioconcentration - uptake of substances from the surrounding medium through gill membranes or other external body surfaces.

Bioavailability - the property of a substance that governs its effect on exposed organisms. A reduced bioavailability would have a reduced toxic effect.

Blow-out preventer control fluid - fluid used to actuate the hydraulic equipment on the blow-out preventer.

Boiler blowdown - discharge from boilers necessary to minimize solids building up in the boilers.

Categorical pretreatment standard - standard promulgated under 40 CFR Chapter I, Subchapter N by EPA for specific industrial categories which specifies quantities or concentrations of pollutants or pollutant properties which may be discharged to a publicly owned treatment works.

Chronic - involving a stimulus that lingers or continues for a relatively long period of time, often one-tenth of the life span or more. Chronic should be considered a relative term depending on the life span of an organism. A chronic effect can be lethality, growth, reduced reproduction, etc. Chronic means "long-term".

Coastal zone - coastal waters and adjacent shorelands strongly influenced by each other (e.g., islands, intertidal areas, salt marshes, wetlands, beaches).

Completion fluids - in oil and gas drilling, any fluid used in a newly drilled oil well to allow safe preparation of the well for production.

Contiguous zone - the entire zone established or to be established by the United States under Article 24 of the Convention of the Territorial Sea and the Contiguous Zone. (Section 502(9) of the CWA)

Controlled discharge rate areas - "zones adjacent to areas of biological concern of the territorial seas of the State of Mississippi" according to the definition in the NPDES general permit covering oil and gas operations in the Gulf of Mexico OCS. For the territorial seas permits of Texas and Louisiana, depth and toxicity may also factor into discharge rate limitations.

Conventional pollutants - defined under 40 CFR Part 401.16 pursuant to section 304(a)(4) of the Clean Water Act. The five conventional pollutants are biochemical oxygen demand (BOD), total suspended solids (TSS), pH, fecal coliform, and oil and grease.

Deck drainage - drainage from the deck of oil and gas facilities, including all waste resulting from platform washings, deck washings, and runoff from curbs, gutters, and drains including drip pans and wash areas.

Desalinization unit discharge - wastewater associated with the process of creating fresh water from seawater.

Diesel oil - distillate fuel oil, typically used in conventional oil-based drilling fluids, which contains a number of toxic pollutants.

Domestic waste - discharges from galleys, sinks, showers, and laundries only.

Drill cuttings - in oil and gas drilling, particles generated by drilling into the subsurface geological formations and carried to the surface with the "drilling fluid."

Drilling fluid - in oil and gas drilling, any fluid sent down the hole, including drilling muds and any specialty products, from the time a well is begun until final cessation of drilling in that hole.

Effluent biomonitoring - the measurement of the biological effects of effluents (such as toxicity, biostimulation, and bioaccumulation).

Effluent limitation - any restriction on quantities, rates, or concentrations of chemical, physical, biological and other constituents which are discharged from point sources into waters of the U.S., including navigable waters of the contiguous zone or the ocean.

End-of-well - in oil and gas drilling, the point at which total well depth is reached. (This definition is taken from the Gulf of Mexico general permit).

Estuary - area where fresh water meets salt water (bays, mouths of rivers, salt marshes, lagoons).

Indirect discharger - a nondomestic discharger introducing pollutants to a publicly owned treatment works.

In-situ - in the natural or original position.

Invert emulsion drilling fluids - in oil and gas drilling, an oil-based drilling fluid that also contains a large amount of water. (This definition is taken from the Gulf of Mexico OCS permit.)

Irreparable harm - significant undesirable effects occurring after the date of permit issuance which will not be reversed after cessation or modification of the discharge. (40 CFR 125.121(a))

Live bottom areas - those areas that contain biological assemblages consisting of such sessile invertebrates as sea fans, sea whips, hydroids, anemones, ascideians sponges, bryozoans, seagrasses, or corals living upon and attached to naturally occurring hard or rocky formations with fishes and other fauna. (This definition is taken from the Gulf of Mexico general permit.)

Marine environment - territorial seas, the contiguous zone and the oceans. (40 CFR 125.121(b))

Maximum hourly rate - in oil and gas drilling, greatest number of barrels of drilling fluids discharged within one hour, expressed as barrels per hour.

Mixing zone - the zone extending from the sea's surface to seabed and extending laterally to a distance of 100 meters in all directions from the discharge point(s) or to the boundary of the zone of initial dilution as calculated by a plume model approved by the Regional Administrator or State Director (where there is an approved NPDES State program), whichever is greater, unless the Regional Administrator or Director determines that a more restrictive mixing zone or another definition of the mixing zone is more appropriate for a specific discharge. (40 CFR 125.121(c))

Muds, cuttings, and cement at the seafloor - in oil and gas drilling, discharges which occur at the seafloor prior to installation of the marine riser.

National Pollutant Discharge Elimination System (NPDES) - the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 301, 307, 318, 402, and 405 of the Clean Water Act.

New source - any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced after the publication of proposed regulations prescribing a standard of performance or pretreatment under sections 306 or 307(c) of the Clean Water Act which will be applicable to such source if such a standard is thereafter promulgated in accordance with the Clean Water Act.

New Source Performance Standards (NSPS) - performance standards promulgated under section 306 of the Clean Water Act.

No activity zones - in oil and gas drilling, those areas identified by MMS where no structures, drilling rigs, or pipelines will be allowed.

Nonconventional pollutants - pollutants which are neither toxic (as listed under Section 307(a)(1) of CWA) nor listed as conventional.

Nonpoint source - causes of water pollution that are not associated with point sources, such as agricultural fertilizer runoff and sediment from construction.

Ocean Discharge Guidelines - ten narrative guidelines listed at 40 CFR Part 125.122 of the Ocean Discharge Criteria Regulations for determination of unreasonable degradation to the marine environment.

Ocean Discharge Requirements - seven narrative requirements listed at section 403(c)(1)(A)-(G) of the Clean Water Act for determination of the degradation of the marine environment.

Permit compliance system (PCS) - procedures established to ensure that a source, issued any permit or requirements to authorize and/or regulate an activity that adds or may add pollutants to the environment, will meet applicable pollution control requirements, including effluent limits and compliance schedules.

Point source - any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft from which pollutants are or may be discharged.

Pretreatment - the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. The reduction or alteration may be obtained by physical, chemical, or biological processes, process changes or by other means, except as prohibited by 40 CFR Part 403

Primary treatment - wastewater treatment (such as screening and grit removal) designed to remove suspended and floating material. As much as 60 percent of the influent suspended solids and 30 percent of the biochemical oxygen demand may be removed through primary treatment.

Priority pollutants - the 126 toxic pollutants listed in Appendix A to 40 CFR 423. The 126 priority pollutants are derived from the 65 classes of compounds listed at 40 CFR 401.15 pursuant to section 307(a) of the CWA.

Privately owned sewage treatment plant - a treatment works not owned by the State, municipality, or intermunicipal or interstate agency.

Produced sands - in oil and gas drilling, the sands and other solids removed from the produced waters.

Produced waters - in oil and gas drilling, the waters and particulate matter associated with producing formations. Sometimes the terms "formation waters" or "brine water" are used to describe produced water.

Publicly owned treatment works (POTW) - a treatment works, as defined in section 212(2) of the Clean Water Act, which is owned by a State, municipality, or intermunicipal or interstate agency.

Risk assessment - the determination of the kind and degree of hazard posed by an agent (e.g., a specific chemical), the extent to which a particular population has been or may be exposed to the agent, and the present or potential health or environmental risks that exist due to the agent.

Sanitary waste - liquid and water borne waste from residences, commercial buildings, industrial plants, and institutions.

Secondary treatment - the level of effluent quality defined in 40 CFR Part 133. Such biological (e.g., activated sludge) and/or physical-chemical treatment is designed to reduce the concentrations of dissolved and colloidal organic matter in wastewater, not removed to any significant degree during primary treatment.

Sewage Treatment Plant - treatment works either publicly or privately owned.

Source water and sand - in oil and gas drilling, water from non-hydrocarbon bearing formations for the purpose of pressure maintenance or secondary recovery including the entrained solids.

Spotting - in oil and gas, drilling the process of adding a lubricant (spot) downhole to free stuck pipe.

Technology-based treatment requirements - NPDES permit requirements based on the application of pollution treatment or control technologies including (under 40 CFR Part 125) BPT (best practicable tech-

nology), BCT (best conventional technology and secondary treatment for POTWs), BAT (best available technology economically achievable), and NSPS (new source performance standards).

Territorial seas - the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles. (Section 502(8) of the CWA)

Toxicity reduction evaluation (TRE) - a study conducted to determine the source(s) of toxicity in a discharge effluent so that these sources can be controlled sufficiently to allow a discharger to comply with their permit limits.

Toxicity test - the means to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of response of an exposed test organism to a specific chemical or effluent.

Toxics Control Program - program developed to reduce the toxicity and/or discharge of toxic pollutants through, for example, effluent limitations or enhanced/upgraded wastewater treatment.

Uncontaminated ballast/bilge water - seawater added or removed to maintain proper draft in vessels.

Uncontaminated seawater - seawater which is returned to the sea without the addition of chemicals. Included are: (1) Discharges of excess seawater which permit the continuous operation of fire control and utility lift pumps, (2) excess seawater from pressure maintenance and secondary recovery projects, (3) water released during the training and testing of personnel in fire protection, (4) seawater used to pressure test piping, and (5) once through, noncontact cooling water.

Unreasonable degradation - significant adverse changes in ecosystem diversity, productivity, and stability of the biological community within the area of discharge and surrounding biological communities; threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms; loss of aesthetics, recreational, scientific or economic values which is unreasonable in relation to the benefit derived from the discharge. (40 CFR 125.121(e))

Variance - any mechanism or provision under section 301 or 316 of the Clean Water Act or under 40 CFR Part 125, or in the applicable effluent limitations guidelines which allows modification to or waiver of the generally applicable effluent limitation requirements or time deadlines of the Clean Water Act.

Water quality-based toxics control - an integrated strategy used in NPDES permitting to assess and control the discharge of toxic pollutants to surface waters: the whole effluent approach involving the use of toxicity tests to measure discharge toxicity, and the chemical specific approach involving the use of water quality criteria or State standards to limit specific toxic pollutants directly.

Water quality criteria - scientifically derived ambient limits developed and updated by EPA, under section 304(a)(1) of the Clean Water Act, for specific pollutants of concern. Criteria are recommended concentrations, levels, or narrative statements which should not be exceeded in a waterbody in order to protect aquatic life or human health.

Water quality standards - laws or regulations, promulgated under section 303 of the Clean Water Act, that consist of the designated use or uses of a waterbody or a segment of a waterbody and the water quality criteria that are necessary to protect the use or uses of that particular waterbody. Water quality standards also contain an antidegradation statement. Every State is required to develop water quality standards applicable to the various waterbodies within the State and revise them every three years.

Well treatment fluids - in oil and gas drilling, any fluid used to enhance production by physically altering oil-bearing strata after a well has been drilled.

Whole effluent toxicity - the aggregate toxic effect of an effluent measured directly by a toxicity test.

Workover fluids - in oil and gas drilling, any fluid used in a producing well to allow safe repair and maintenance procedures.

Appendix C

Fact Sheets on 403(c) Discharges

Publicly Owned Treatment Works Subject to 403(c)
Offshore Oil and Gas Facilities Subject to 403(c)
Alaskan Seafood Processors Subject to 403(c)
Offshore Placer Mining in Alaska Subject to 403(c)
Log Transfer Facilities in Alaska Subject to 403(c)
Seawater Treatment Plants Subject to 403(c)
Cane Sugar Mills Subject to 403(c)
Petroleum Refineries Subject to 403(c)
Pulp and Paper Mills (Regions IX and X) Subject to 403(c)
Sawmills Subject to 403(c)

FACT SHEET ON PUBLICLY OWNED TREATMENT WORKS SUBJECT TO 403(c)

How many are there?

POTWs are owned and operated by municipal governments for the purpose of treating municipal sewage and industrial wastes. Excluding offshore oil wells and power plants, POTWs constitute the largest group of land-based pipe discharges to marine waters, both by numbers of discharges and total volume of effluent discharged. Nationwide, POTWs account for 134 of the 332 ocean outfalls subject to 403(c) Ocean Discharge Criteria (Table 1). They contribute about 83 percent of the effluent discharged to the ocean.

What are the typical effluent characteristics?

- POTW effluent consists primarily of treated domestic sewage, but in many cases also treated industrial wastes. Small POTWs often receive only domestic sewage. Large POTWs typically receive industrial wastes from multiple sources.

- POTWs must develop and enforce pretreatment programs to control toxic industrial wastewater discharges if the POTWs either have a design flow greater than 5 MGD or if nondomestic (e.g., industrial) wastes are received that cause treatment plant upsets, contaminate sludge, or violate NPDES permit limits.

- Effluent flows and mass loadings of pollutants vary greatly, depending on the size of the service population; the number, sizes, and types of industries that contribute influent to the treatment works; and the level of treatment achieved by the plant.

- Small POTWs may discharge less than 10,000 gallons per day. The largest POTW effluent volume currently discharged to the ocean is 400 million gallons per day (MGD), which is discharged by the Los Angeles County Sanitation Districts.

- Major pollutants are suspended solids, chlorine, biochemical oxygen demand (BOD), priority pollutants, and other toxic substances. Fecal coliform bacteria and various pathogens may also be discharged if the effluent is not chlorinated.

- Effluent concentrations of suspended solids and BOD each must be less than or equal to 30 mg/L to meet secondary treatment requirements. One exception is for waste stabilization ponds and trickling filters that qualify for equivalents to secondary treatment limits (45 mg/l in BOD, TSS). Another exception is POTWs holding Section 301(h)-modified NPDES permits are permitted to discharge suspended solids and BOD in excess of 30 mg/L. Some POTWs holding Section 301(h) modified permits discharge suspended solids and/or BOD in excess of 100 mg/L.

- Individual priority pollutant metals are, in some cases, discharged at concentrations in excess of 5 mg/L. Individual priority pollutant organic compounds and other toxic substances are typically discharged at much lower concentrations, but may reach concentrations of 0.5 mg/L in the effluent.

What is the behavior and fate of the effluent in the receiving water environment?

- Effluent is typically discharged at water depths of 20-200 ft.

- Effluent is positively buoyant (Figure C-1). As it ascends through the water column, it is diluted by entrainment of the surrounding receiving water. The degree of dilution varies with depth of the discharge, densities of the effluent and receiving water, height-of-rise of the effluent plume, and design of the outfall diffuser (if any).

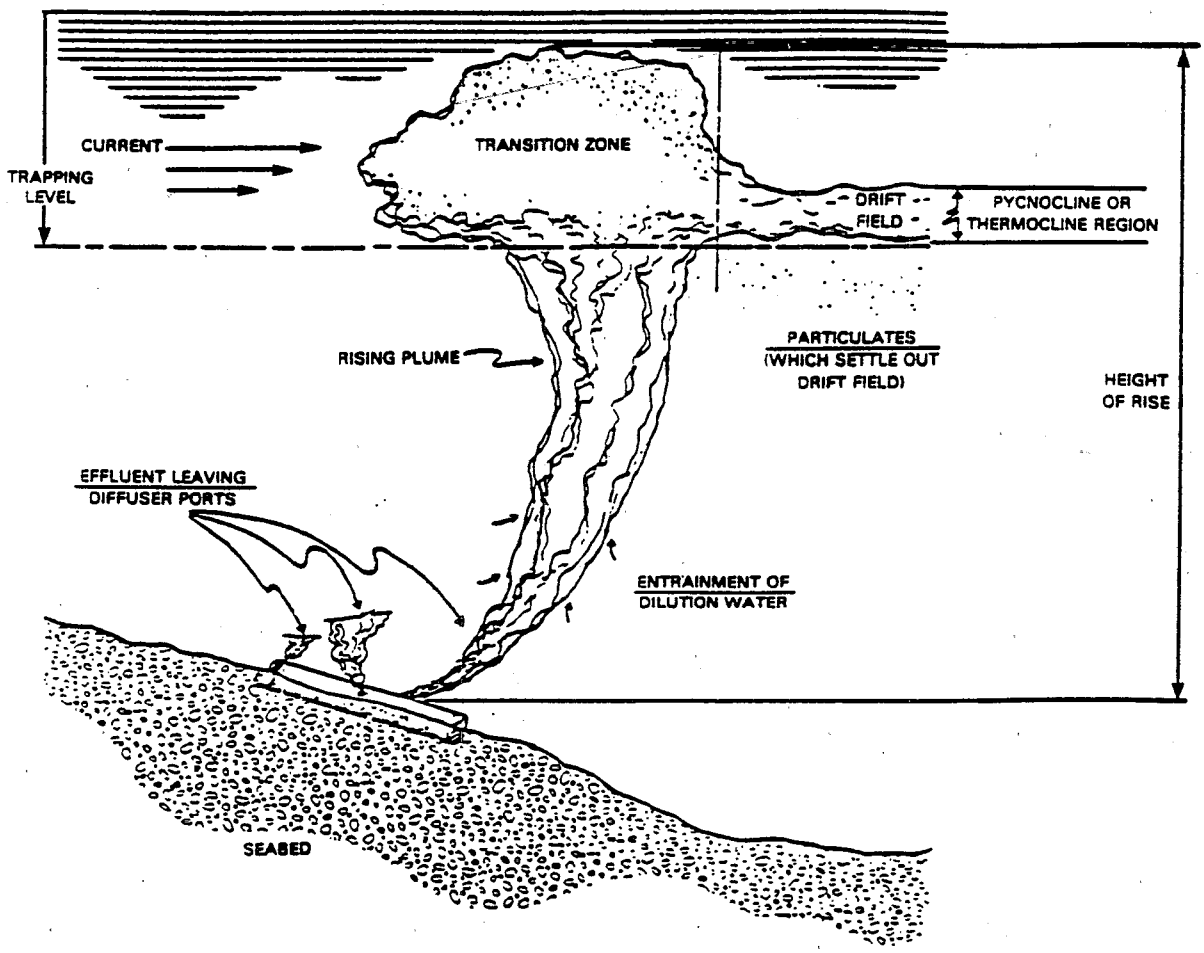

Figure C-1. Physical processes influencing submerged ocean discharges.

- The effluent wastefield is transported by currents and tides. The wastefield is diluted during transport, but dilution occurs slowly. As the wastefield travels, particulates settle out of the water column and are deposited on the bottom.

- The quantities of effluent-derived materials that are deposited on the bottom, and their distribution on the bottom are determined by the mass emission rates of those materials, the hydrographic characteristics of the receiving environment, and the behavior of the effluent wastefield.

- Organic materials in the effluent may be oxidized or biodegraded in the water column. If sufficiently small, they may be transported great distances before settling to the bottom. Organic materials deposited on the bottom may be oxidized, biodegraded, foraged by benthic organics, or mixed by organisms into the sediments.

- Priority pollutants and other toxic substances in the effluent are typically bound to particulates. These substances may be transported out of the immediate receiving environment or bioaccumulated by organisms in the water column. Most are deposited on the bottom and form a reservoir in the sediments. Priority pollutants and other toxic substances in the sediments may cause toxic effects in, or be bioaccumulated by, benthic organisms and demersal fishes. Priority pollutants and other toxic substances that are dissolved in the effluent (that is, not bound to particulates) may be transported out of the immediate receiving environment, or may cause toxic effects in, or be bioaccumulated by organisms found in the water column.

What are the primary physical, chemical, and biological impacts?

- Potential impacts to water quality include increased suspended solids, increased turbidity, decreased light transmittance, reduced oxygen concentrations, changes in pH, and nutrient enrichment. Aesthetic effects (e.g., water discoloration, surface scum, foam, oil, and grease) may also occur.

- Water quality impacts may occur over a large area, particularly if the POTW discharges a very large volume of effluent (i.e., 100 MGD).

- Nutrient enrichment of the water column may cause alterations in the structure and productivity of phytoplankton communities, which in turn may impact zooplankton and fishes in the water column (Figure 4b).

- Particulates that settle out of the effluent wastefield degrade sediment quality. Sediments may become organically enriched, and, in cases of severe impacts, deplete the oxygen content of the sediments. Priority pollutants bound to particulate matter may contaminate the sediments.

- Organic enrichment of the sediments may cause abundances of some species of benthic infauna and bottom-dwelling (demersal) fishes to be reduced substantially, and may promote the recruitment and growth of opportunistic and pollution-tolerant species. Demersal fish communities may also be altered because of changes in the benthic food base.

- Priority pollutants and other toxic substances that are bioaccumulated by commercially and recreationally harvested species of fish, shellfish, and plants may, upon consumption, impact human health. Impacts include direct sublethal effects and carcinogenicity.

- Particulate matter from sewage effluent may contaminate and/or bury shellfish and shellfish beds, compromise the quality of spawning and nursery areas, and interfere with fish foraging activities, thereby impacting recreational, subsistence, and commercial fisheries.

- If the effluent is not chlorinated, pathogens in the effluent may contaminate shellfish and result in restrictions on water contact activities (e.g., swimming).

- Environmental impact assessments are usually required for siting of new POTW outfalls. Through that process, discharges into areas with sensitive or unusual biological communities (e.g., coral reefs), threatened and endangered species, special aquatic sites, or areas necessary for critical life stages or functions of an organism are avoided or minimized. However, many POTW outfalls are old, and predate applicable federal

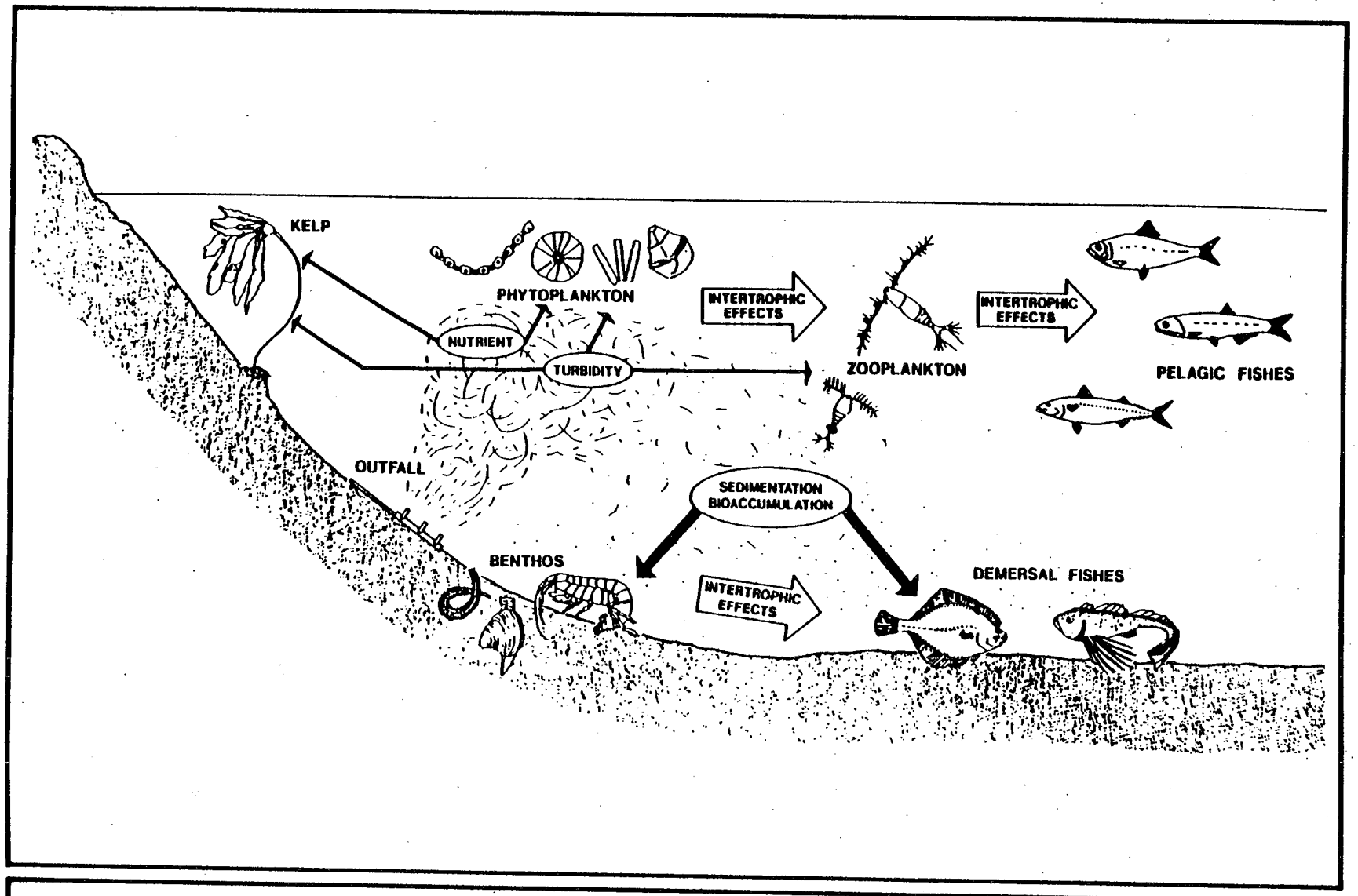

Figure C-2. Potential biological impacts of municipal wastewater discharges.

and state statutes. Some of those older outfalls are located in less desirable (i.e., more vulnerable) receiving environments.

- The potential for recovery after cessation of the discharge is high for the organic materials deposited in the sediments. However, priority pollutants and other toxic substances may persist in the sediments indefinitely. Bioturbation, erosion, and storm events may re-expose these substances to the water column and resident biota.

Other statutory requirements:

- POTWs must meet federal effluent quality specifications for secondary treatment, unless they hold a Section 301(h) modified NPDES permit. Such permits provide alternative effluent quality specifications. Of the 134 POTWs subject to Section 403(c), 27 have received tentative or final approval for 301(h) waivers.

- POTWs must be in compliance with state water quality standards and BAT/BCT.

- POTWs holding Section 301(h) modified permits must demonstrate compliance with marine water quality standards as well as applicable marine water quality criteria (40 CFR Part 125 Subpart G).

- Industries discharging to POTWs must comply with pretreatment requirements. General Pretreatment Regulations establish two types of Federal standards to control toxic industrial wastewater discharges to POTWs; categorical pretreatment standards and prohibited discharge standards. The pretreatment regulations also require POTWs to develop pollutant-specific local limits (40 CFR Part 403).

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FACT SHEET ON OFFSHORE OIL AND GAS FACILITIES SUBJECT TO 403(c)

How many are there?

Offshore oil and gas operations consist of drilling and production facilities located either in state waters, seaward of the baseline, or Federal waters. Wells are drilled from either single well structures or from multiple well platforms (see Figure C-3). Two major categories of discharges occur from these structures: 1) drilling fluids and drill cuttings (from exploratory and development wells), and 2) produced water (from production facilities).

In most cases, offshore oil and gas facilities in Federal waters are permitted under an NPDES General permit. A General permit is issued when similar facilities with similar effluents are located in similar receiving waters. Permits are issued for:

- Exploratory facilities which are usually barges, semi-submersibles or drillships that typically drill only a few wells from one site. It is estimated that in recent years, on the average, over 200 exploratory wells have been drilled annually.

- Production facilities are usually fixed platform structures on which multiple wells are drilled. During the years 1953 - 1986, 3889 production platforms were installed and 455 were removed in Federal waters. Each platform may have any where from a few wells (1-6) to a large number of wells (80-120). It is estimated that in recent years, on the average, approximately 700 production wells have been drilled annually.

From 1954 -1986 26,019 wells were drilled in Federal waters. Approximately 25% of these were exploratory wells and 75% production. Very little information is available for facilities in state waters, however it is estimated that there are 800 platforms and 1,423 producing wells in the state waters of Louisiana subject to 403(c). Louisiana has more dischargers within its state waters than any other single state.

What are the typical effluent characteristics?

- Primary effluents discharged in exploration operations are drilling fluids and drill cuttings. The primary effluent discharged in production operations is produced waters. These are the most important discharges in terms of impact and volume.

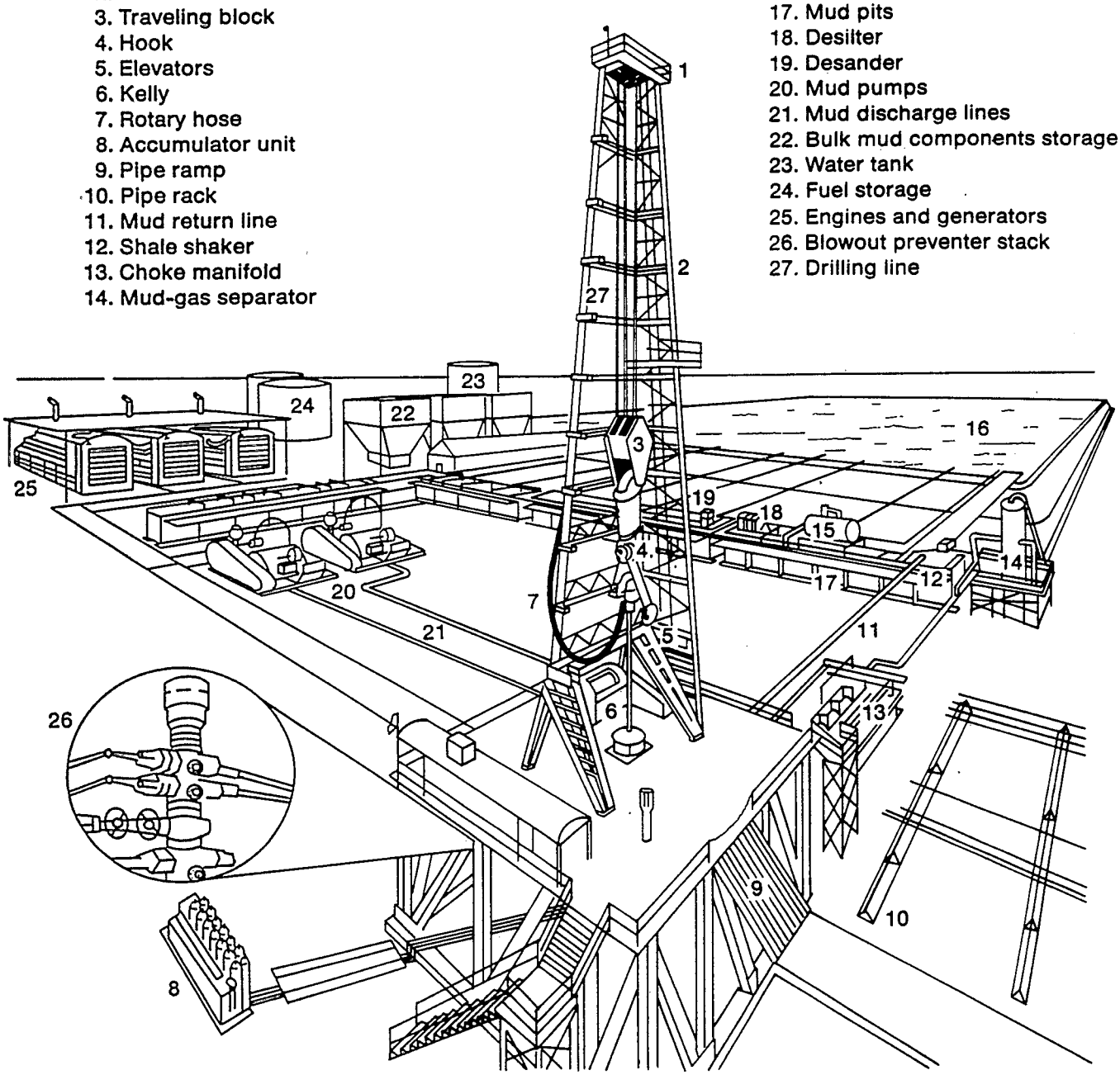
- Drilling fluids (also known as drilling muds or simply "muds") are slurries (typically 20-70% solids by weight) of solids and dissolved materials in a water or oil base that are used in rotary drilling operations. They lubricate the drill bit and help control subsurface pressure. Five basic components account for approximately 90 percent by weight of drilling mud materials: barite, clay, lignosulfonate, lignite, and caustic soda. Water-based muds have water as the carrier phase, although they may contain from 2% to 6% oil. Oil-based muds are those that have a water in oil emulsion, have a minimum oil content of approximately 40%, and are generally more costly and much more toxic than water-based muds. They are normally used in more difficult drilling conditions but are not discharged. Approximately 6,168,000 barrels (bbls) of drilling fluids are discharged offshore annually (assuming 10% are barged to shore for land-based disposal).

- Treatment options for drilling fluids are extremely limited, with controlling the toxicity of mud constituents through product substitution and barging to onshore facilities the only currently-used alternatives.

- Drilling mud toxicity of 30,000 ppm does not guarantee that the health criteria for PAH, arsenic and beryllium or the acute toxicity criterion for aquatic life for PAH will be met. In order for these criteria to be met, additional treatment may be required.

Figure C-3. The Rotary Rig and Its Components

1. Crown block and watertable
2. Mast
3. Traveling block
4. Hook
5. Elevators
6. Kelly
7. Rotary hose
8. Accumulator unit
9. Pipe ramp
10. Pipe rack
11. Mud return line
12. Shale shaker
13. Choke manifold
14. Mud-gas separator
15. Degasser
16. Reserve pit
17. Mud pits
18. Desilter
19. Desander
20. Mud pumps
21. Mud discharge lines
22. Bulk mud components storage
23. Water tank
24. Fuel storage
25. Engines and generators
26. Blowout preventer stack
27. Drilling line



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- Drill cuttings are fragments of the geologic formation broken loose by the drill bit. Drill cuttings are carried to the surface by drilling fluids. Cuttings are then removed from the drilling fluid by a variety of solids control equipment and most of the fluids are reused while the cuttings are discharged near or below the water surface. This discharge consists of drill cuttings, wash solution, and drilling muds that still adhere to the cuttings. These cuttings discharges can contain as much as 60 percent by volume drilling fluids. Approximately 1,302,000 bbl of drill cuttings are discharged annually.

- Treatment options for cuttings include those applicable to drilling fluids and also include several technologies for reducing the oil content of cuttings from oil-based muds that are at a development stage of implementation.

- Produced water (also known as production water, process water, formation water, or produced brine) is the water brought up from the hydrocarbon-bearing strata with the produced oil and gas. Produced water is primarily formation water plus injection water and various added chemicals (biocides, coagulants, corrosion inhibitors, etc.). Before the treatment stage, produced water may contain several hundred to a thousand or more parts per million of oil. Produced water is then usually treated in an oil-water separator and is discharged into receiving waters. In some cases, after being treated in the oil-water separator, it is filtered to remove solids and is then reinjected for disposal or pressure maintenance. Recent findings have indicated that radioactive materials, such as radium, from formation waters may be a potential problem in some produced waters. Treatment options for produced water associated with radioactive material inlcude filtration and reinjection. A 1985 study by the Offshore Operators Committee indicated that 1.5 million barrels of produced water per day were discharged into state and Federal waters of the Gulf of Mexico.

- Benzene and PAH's are present in produced water and may cause some impacts. Metals found include lead, copper, nickel, and mercury. Biocides also contribute to the toxicity of produced water.

- The amount of in stream dilution necessary to meet a typical state quality standard for toxicity (usually .01 x 96-hr LC50 for sensitive marine species) is about 4:1. Since the human health criteria for fish consumption for benzene and PAH and the chronic aquatic criterion for phosphorus are generally very low compared to the water quality toxicity standard, further treatment of produced water is required to meet these additional criteria.

- Drilling fluids, cuttings and produced water may contain substances that exert oxygen demand. The amount will vary depending on the chemical composition of the effluent. Comparisons made of the BOD and COD associated with discharged muds and cuttings have found that the oxygen demand values were directly related to the type of mud used and whether or not oil was present. BOD values ranged from 21mg/kg for a mud with no oil added, to 9,552 mg/kg for a mud with 5% oil added. COD values ranged from 420 mg/kg for mud with no oil added to 98,300 mg/kg for a mud with 5% oil added. BOD and COD can also be affected by the formation that is being drilled through. BOD values for cuttings ranged from zero to 8,567 mg/kg. The COD of cuttings ranged from zero to 272,000 mg/kg. This will vary greatly according to the drilling fluid the cuttings are associated with.

- Secondary effluents are deck drainage, produced sand, sanitary wastes, domestic wastes, completion fluids, cement, workover fluids, water flood discharges, blowout preventor fluids, desalinization unit discharges, fire control system test water, non-contact cooling water, ballast and storage displacement water and bilge water.

What is the behavior and fate of the effluent in the receiving water environment?

- Discharges of drilling fluids and cuttings occur as both "semi continuous" discharges of drill cuttings and periodic bulk discharges of drilling fluids. Volume discharged will be dependent on depth of the well and the number of times the mud system has to be changed to accommodate drilling conditions.

- Drilling fluid plumes flow through three phases:

convective descent, dynamic collapse, and passive diffusion. During convective descent, larger, denser particles settle out of the plume. During dynamic collapse, the plume reaches either the sea floor or neutral buoyancy in the water column. In the passive diffusion stage, the plume is made up of less than 10 percent solids which are dispersed by passive diffusion and convective mixing.

- Drill cuttings, because of their generally larger particle sizes, settle out of the water column and come to rest on the sea floor close to the discharge point. "Close" may mean within 100m in low energy, shallow depths or it may mean within 1000m in high energy or deep sites; in either case, cuttings will generally settle out closer than the associated drilling fluid because of their generally larger particle sizes. They are generally not subject to much resuspension in low to moderate energy environments. In certain conditions, burial of benthic communities is a concern, for example, sessile benthic communities of concern (coral, seagrasses, oyster beds, etc.).

- The quantities and salinities of produced waters discharged vary considerably among platforms. Produced water can be discharged either above or below the water surface. Although most produced waters are brines, the chloride content may range from less than that of seawater to several times the chloride concentration of seawater.

- Specific behavior and fate of the effluent will vary according to depth and hydrology of the receiving water. Transport and dilution of the descending discharge plume is dependent on discharge rate, circulation, wind and wave conditions, water depth, and water column stratification. Very few data are available on shallow water transport and fate. Likewise, although short-term data exist for single well scenarios, no short- or long-term data yet exist for development operations (multiple well scenarios of 5-100 wells).

- Depending on specific drilling fluid constituents and local dispersion conditions, it is possible that the movement of the effluent plume could cause violations in water quality standards for certain pollutants.

What are the primary physical, chemical, and biological impacts?

Drilling fluids and cuttings

- Biological impacts from discharges of drilling fluids and cuttings depend on the toxicity of the discharge, the type and amount discharged and exposure time. Of the major ingredients in drilling fluids only a few are considered substantially toxic to marine organisms; these include chrome or ferrochrome lignosulfonate and sodium hydroxide. However, the minor components (minor on a weight basis) are significant sources of toxicity. These include diesel oil, mineral oil, biocides, surfactants and emulsifiers, etc.

  - 96 hour LC50 values range from practically nontoxic (several hundred thousand ppm) to toxic (500 ppm for a 9:1 mud: seawater slurry). Permits currently limit toxicity to 30,000 ppm of a 9:1 mud:seawater slurry as a BPJ determination of BAT.

  - Most metals occur in forms that appear to have relatively low bioavailability, although some exceptions occur (i.e., Cd and As). Barite (used in most fluids) comes from two types of geologic formations, with one being characterized by high levels of many trace metals. Hg and Cd have been limited in some BPJ NPDES permits.

  - Discharges of muds or cuttings containing diesel oil have been prohibited in some permits, or their discharge is conditional on use and removal as a pill to free stuck pipe and not violating a 30,000 ppm BPJ limitation.

- Primary physical impacts may result from disruption and/or burial of benthic communities or incorporation into the sediments by drill cuttings. In these cases, recovery of impacted areas is generally slow.

- Increased concentrations of suspended solids may cause a varying degree of turbidity according to ambient conditions.

Produced Water

- In some areas, produced water creates a potential for environmental effects due to high salinity, low dissolved oxygen, and high levels of

petroleum hydrocarbons and heavy metals. Radioactivity in produced water is a problem whose significance is currently under assessment. However, preliminary data indicate sediment accumulation of radionuclides may be substantial.

- Produced water discharges have shown adverse benthic impacts in shallow areas of low energy (low flushing). Benthic impacts have a highly limited data base, in more energetic, offshore areas, but are currently being assessed by industry.

- Field data on potential impacts are limited to single well scenarios. Information on field studies of a multiple well development platform have been conducted, but the data is not readily available.

Other statutory requirements:

- Effluent guidelines and new source performance standards for the offshore subcategory were first proposed by EPA on August 26, 1985. On October 21, 1988, the Agency issued a Notice of Data Availability with new technical, economic and environmental assessment information. NPDES permits for offshore oil and gas must comply with BPT guidelines and BAT conditions developed on the basis of the Region's Best Professional Judgement (BPJ).

- Effluents in state waters should be in compliance with state water quality standards which are conditions in NPDES permits. The State of Louisiana is actively requiring State coastal use permits. California has specific standards for ocean waters. Other states may follow suit.

- A consistency determination with a state's Coastal Management Plan is required if the state has one in place.

- Compliance with the Endangered Species Act is required.

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Technical Resources Inc. 1988. Analysis of Effluent Dispersion Models Potentially Applicable to Shallow Water Discharges from Oil and Gas Activities. Prepared for US EPA Region VI.

FACT SHEET ON ALASKAN SEAFOOD PROCESSORS SUBJECT TO 403(c)

How many are there?

There are currently approximately 300 seafood processing facilities (both mobile and shore-based) in Alaska that are subject to 403(c) ocean discharge criteria. EPA issued a general NPDES permit for seafood processors in Alaska on June 18, 1984, and it expired on June 18, 1989. On June 18, 1989 EPA proposed to reissue this general permit. Individual permits are issued to large facilities in sensitive receiving environments.

What are the typical effluent characteristics?

- Primarily salmon, crab, herring, halibut, and bottom fish processing wastes.
- Effluent flows range from 450 to 23,000 gal per 1,000 lbs of raw product.
- Major pollutants are total suspended solids, oil and grease, and biochemical oxygen demand (BOD) (Total suspended solids 1-340lbs/1,000 lbs; oil and grease -48 lbs/1,000 lbs; BOD 2-180 lbs/1,000 lbs). U.S. EPA effluent guidelines for fish species processed and type of processing are provided in 40 CFR 408.
- Seafood processing wastes from remote locations must be ground to 1.27 cm (0.5 in). Installation of fine mesh screening for solids collections is required for waste discharges from nonremote locations.
- Other pollutants include chlorine, ammonia, and fecal coliform bacteria.
- Pollutants are considered conventional and nontoxic.
- Pollutants are biodegradable and do not bioaccumulate.

What is the behavior and fate of the effluent in the receiving water environment?

- Discharge depths are typically 20-70 ft.
- Most seafood waste settles out of the water column quickly, is deposited in a pile in the immediate area of the discharge, and typically is not subject to resuspension, except in locations with steep bottom slopes and vigorous tidal scouring resulting in redeposition in adjacent locations.
- The size of the waste pile is influenced by discharge volume, circulation patterns, and submarine topography.
- Loss of material from the waste pile occurs because of foraging by organisms, decay, and pile slumping or dispersion.
- Reduced impacts on water quality and aquatic habitat occur in areas of adequate circulation and flushing.

What are the primary physical, chemical, and biological impacts?

- Potential water quality impacts include oxygen depletion, sulfide production, ammonia generation, nutrient enrichment, and aesthetic effects (e.g., water discoloration, surface scum and foam).
- Water quality degradation generally is confined to areas of ocean bottom near this outfall.
- Biological impacts include covering and suffocating benthic communities, benthic infauna mortality or stress due to low dissolved oxygen or the production of toxic degradation products (e.g., hydrogen sulfide, ammonia), alterations in

fish communities due to changes in food supply, and algal blooms due to nutrient enrichment.

- The discharge could impact recreational, subsistence, and commercial fishing by covering (smothering) shellfish beds, interfering with fish foraging activities, and obliterating spawning grounds.

- Adverse impacts of human health are not expected.

- There is potential for recovery after cessation of discharge, but the length of time to recovery is still a question.

Other statutory requirements:

- The discharge of primarily conventional, non-toxic pollutants is expected to be in compliance with federal marine water quality criteria.

- The State of Alaska has determined that the discharges authorized by this permit are consistent with the Alaska Coastal Management program.

REFERENCES

U.S. Environmental Protection Agency. 1983. NPDES Permit and Fact Sheet for Alaskan Seafood Processors. Application No. AL-G-52-0000. U.S. EPA Region X, Seattle, WA.

U.S. Environmental Protection Agency, Section 74 Seafood Processing Study. Executive Summary. Washington, D.C. September, 1980.

U.S. Environmental Protection Agency, Developmental Document for Effluent Limitations Guidelines and New Source Performance Standards for the Fish Meal,Salmon, Bottom Fish, Clam, Oyster, Sardine, Scallop, Herring, and Abalone Segment of the Canned and Preserved Seafood Processing Point Source Category. Washington, D.C. September, 1975.

U.S. Environmental Protection Agency, Developmental Document for Effluent Limitations Guidelines and New Source Performance Standards for the Catfish, Crab, Shrimp, and Tuna Segment of the Canned and Preserved Seafood Processing Point Source Category, Washington, D.C. June, 1974.

FACT SHEET ON OFFSHORE PLACER MINING IN ALASKA SUBJECT TO 403(c)

How many are there?

Currently there are 474 NPDES individual permits for gold placer mining in Alaska. Generally, these operations involve removal of gold ore or gold-bearing sands from creeks, rivers or beaches. In two unique cases, placer mining is happening in offshore marine areas. Region X has determined that some of the new applications for beach placer mining will be subject to the provisions of 403(c). The only two offshore gold dredging operations (both permitted to Westgold) are in compliance with 403(c) through conditions in individual NPDES permits. These unique operations involve dredging gold-bearing sediments for processing at a separate onshore facility, while the remainder of dredged material is discharged onto the seafloor.

What are the typical effluent characteristics?

- Effluent from the offshore operation consists of seawater and natural bottom sediments.
- No substances are added to the process stream.
- The discharge from WestGold will consist of approximately 13,680 m^3 per day of solids and an additional 55 MGD of associated seawater. The concentrations of clay, silt, sand, and gravel range from 0.1-0.5, 8-21, 56-67, and 21-30 percent, respectively, in the mined sediment.
- Pollutants in the discharge include metals, suspended solids, and total solids. Arsenic, copper, lead, nickel, and possibly mercury are identified as potential pollutants in WestGold's effluent.
- Toxic concentrations of metals in the discharge have not been observed. However, there is uncertainty regarding the presence of mercury, and other potentially toxic and bioaccumulative substances, in the dredged sediments.
- Discharge of silts and clays produces turbidity throughout the water column.
- The tailings discharged by the pipe will entrain ambient water in the descending plume and flow as a turbidity current in the water column or on the bottom.

What are the primary physical, chemical, and biological impacts?

- Potential water quality impacts include excessive turbidity and suspended solids, and increased bioavailability of toxic metals.
- Potential impacts to aquatic biota from the discharge include:
  - Burial of benthic communities or habitats
  - Obstruction of anadromous fish migration routes caused by the turbidity.
  - Inhibition of benthic infauna recolonization due to the presence of toxic concentrations of metals, altered substrate and food supply.
- Fish and mammal species harvested in Norton Sound are highly mobile and are not likely to be impacted by the operation.
- Greater impacts on the king crab fishery are expected from the dredging than from the discharge.
- Because of possible toxicity and bioaccumulation, monitoring for the forms and amounts of mercury and other trace metals in the effluent has been required.
- Adverse impacts to human health are not expected, although the increased bioavailability of metals that bioaccumulate requires further evaluation.

- Authorized discharges are not likely to cause permanent and significant harm to the marine environment.

- The potential for recovery after cessation of dredging and discharges is estimated to be in excess of 5 years.

Other statutory requirements:

- A consistency determination with the Alaska Coastal Zone Management Plan, and other applicable coastal zone plans (e.g., the Nome Coastal Zone Management Plan), is required.

- The discharge of placer mining effluent is prohibited by the State of Alaska within 100 ft of mean lower low tide and within 1 mi of anadromous fish streams.

- The Nome Coastal Zone Management Plan stipulates that all mining activities must occur 100 ft seaward of mean lower low water. There is also a one mile zone at the mouths of salmon streams, where mining or discharge may not occur. Under that plan, mining is prohibited in commercial or subsistence fishing areas during the open fishing season.

- Compliance with federal marine water quality criteria for metals at the edge of a 100-m mixing zone must be verified.

- The discharge must comply with the State of Alaska's water quality standards for turbidity at the edge of the 500-m mixing zone. Based on a worst-case analysis of the suspended solids plume for the WestGold operation, suspended solids concentrations may cause violations of these standards.

- U.S. EPA Region X has concluded that discharges authorized by WestGold's NPDES permit will neither jeopardize the continued existence of any threatened or endangered species nor adversely affect its critical habitat. In addition, no marine sanctuaries or other special aquatic habitats exist in the vicinity of WestGold's permit area.

REFERENCES

U.S. Environmental Protection Agency. 1985. NPDES Permit and Fact Sheet for Power Resources Corporation gold placer mining operation (Westgold). Application No. AK-004319-2. U.S. EPA Region X, Seattle, WA.

FACT SHEET ON LOG TRANSFER FACILITIES IN ALASKA SUBJECT TO 403(C)

How many are there?

Activities associated with log transfer facilities in Alaska include the transportation, storage, and sorting of western hemlock, Sitka spruce, and cedar logs. Currently, there are 30-35 individual NPDES permits for log transfer facilities in Alaska. These facilities are located primarily in southeast Alaska and appear to be subject to 403(c) ocean discharge criteria. However, only the Shee Atika facility has been reviewed under 403(c) to date.

What are the typical effluent characteristics?

- The effluent generally consists of three classes of material: 1) bark, leachate, and other wood debris lost during log storage, sorting, and transfer; 2) oil, grease, and other petroleum products used for log handling equipment; and 3) entrained soil and particulate matter.
- Because the discharge of wastes from log transfer facilities is via diffuse sources, it is not possible to determine effluent flows.
- The quantity of wood debris discharged to receiving waters is site-specific depending on species of wood, type of transfer process, and best management practices in effect at the site.
- Wood is composed of cell wall components (e.g., cellulose, lignin) and extractable organic compounds (e.g., tannins, resins, terpenes).
- Although wood debris is generally considered nontoxic (except hemlock), wood leachates (e.g., tannins) can be toxic to fish at high concentrations.
- Wood wastes have variable rates of degradation. For example, refractory material such as cellulose requires more time for breakdown than extractable components such as carbohydrates.

What is the behavior and fate of the effluent in the receiving water environment?

- The discharge of wastes from log transfer facilities into marine waters occurs during transportation of logs from the upland site to the storage yard, during transfer of logs from the storage yard to the water, and during storage of logs in rafts in the water prior to export.
- Oil, grease, other petroleum products, and entrained soil and particulates can be transported to the receiving waters via surface water runoff from the site.
- Physical characteristics of the wood and circulation patterns of the receiving water influence the transportation and distribution of wood debris and leachates. Tidal currents, which tend to be strongest in constricted areas, are an important transport mechanism.
- The majority of the wood waste initially floats and then sinks after becoming saturated with water.
- Once in the water, both logs and bark release leachates.
- Wood debris accumulates on the ocean floor in quiescent areas (e.g., bays, coves) where surface and subsurface currents decrease.
- By causing logs to chafe in the storage area, wind- and wave-driven currents can dislodge bark

What are the primary physical, chemical and biological impacts?

Chemical and Physical Impacts

- Potential water quality impacts include increased concentration of suspended solids, turbidity, settleable solids, floating solids and debris, oil and grease, and leachates.

- The decomposition of wood debris on the ocean floor can cause increases in BOD and chemical oxygen demand (COD), potentially depleting dissolved oxygen in the interstitial waters of the waste deposits and in the overlying waters.

- Elevated concentrations of potentially toxic degradation products (e.g., hydrogen sulfide, ammonia) may also occur in the interstitial waters of the waste deposits.

- The presence of bark, log bundles, and log booms in nearshore waters can reduce subsurface circulation in the storage area.

- Log rafts can also shade the water column, inhibiting growth of benthic algae and eelgrass and thereby reducing productivity.

Biological Impacts

- Accumulations of wood debris can cover the bottom and smother plants and animals (losses of suspension-feeding bivalves has been observed in deposits thicker than 1 cm, and the majority of dominant polychaetes are eliminated in deposits thicker than 5 cm).

- Epifauna are eliminated in areas of extensive wood debris deposition. However, scattered deposits may provide additional substrate for epifauna.

- Reproductive or somatic deficiencies in Dungeness crabs residing in bark deposits have been reported recently.

- Although wood leachates are toxic to salmon fry, it is unlikely that leachates kill these or other fish because they can generally avoid areas of high leachate concentrations.

- Impacts to the infaunal benthic community may result in localized but potentially adverse changes in the food supply of economically important predators, including king crab, Dungeness crab, halibut, and salmon.

- Because wood debris wastes are primarily nontoxic and do not bioaccumulate, adverse impacts to human health are not expected.

- Based on observations of benthic infauna recolonization of inactive wood waste deposits, there is a high potential for recovery following cessation of discharge.

Other Statutory Requirements

- Before issuance of an NPDES permit for the discharge of wood debris from log transfer facilities, a determination that the permitted activities are consistent with the Alaska Coastal Zone Management Plan must be made in accordance with the Federal Coastal Zone Management Act.

- Pollutants discharged by log transfer facilities are expected to be in compliance with federal marine water quality criteria.

- Best Professional Judgement (BPJ) determinations are used to set discharge limitations and best management practices to ensure that Alaska Water Quality Standards are not violated.

REFERENCES

U.S. Environmental Protection Agency. 1985. NPDES Permit and Fact Sheet for Shee Atika, Inc. log transfer facility. Application No. AK-0004048-7. U.S. EPA Region X, Seattle, WA

FACT SHEET ON SEAWATER TREATMENT PLANTS SUBJECT TO 403(c)

How many are there?

There are currently three seawater treatment facilities subject to 403(c) ocean discharge criteria. These plants are located on the Beaufort Sea coast of Alaska. These facilities filter, deaerate, and chlorinate seawater used in the waterflood method of oil recovery. The waterflood process is used on the North Slope to increase oil production. Treated seawater is injected into the oil-producing reservoir, forcing residual oil to the surface.

What are the typical effluent characteristics?

- Effluent is composed primarily of water used to backwash the strainers and filters in the seawater treatment plant. Other discharges include sanitary wastes and seawater passing through the Marine Life Return System (MLRS).

- The highest monthly average discharge rate at the ARCO Prudhoe Bay Waterflood facility, June 1984-October 1985, was 9.0 million gallons per day.

- Major pollutants are total suspended solids (TSS) and total residual chlorine (TRC). The current NPDES permit authorizes the following concentrations:

Pollutant	Open-Water Season	Under-Ice Season
TSS: Maximum daily	170,000 lb/day	6,000 lb/day
TRC: Maximum 4-day mean	0.15 mg/L	0.05 mg/L
Maximum	0.35mg/L	0.15mg/L

- Other pollutants include chlorine reaction products and floatable solids. Receiving water temperatures may also be increased.

- These constituents include conventional, non-conventional, and toxic pollutants.

- Chlorine reaction products may bioaccumulate in marine organisms.

What is behavior and fate of the effluent in the receiving water environment?

- Water column depths at the discharge are typically shallow. The ARCO Prudhoe Bay Waterflood discharge site is 12 ft deep during the open-water season and as shallow as 5 ft deep when ice-covered.

- Highly seasonal and extreme conditions in the receiving environment increase chances of detrimental effects. Relatively static conditions exist under the ice cover during the winter (November-June) and accumulation of TSS is expected to be greatest at this time. However, the discharge has lower quantities of both TSS and TRC during this period.

- Currents and waves during the open-water season (July-October) rapidly mix and disperse discharged effluent.

- Transport and fate of discharged particulates and chlorine reaction products and their persistence in the sediments has not been well-established.

- Because large volumes are discharged over a long time period, it is possible that even low concentrations of chlorine reaction products may accumulate to unacceptable concentrations in the environment.

What are the primary physical, chemical, and biological impacts?

- Water quality variables that could be affected by the discharge are turbidity, sedimentation rate, amount of floating solids, temperature, and concentrations of total residual chlorine and

chlorine reaction products.

- Diversity and abundances of benthic organisms could be affected by changes in sediment characteristics (e.g., grain size) or sediment deposition rate.

- Although endangered species occur in the Beaufort Sea (e.g., bowhead and gray whales), U.S. EPA has concluded that the discharge will have no effect on any endangered or threatened species or its critical habitat.

- Impacts on commercial, subsistence and recreational fisheries in the Beaufort Sea are not expected.

- The potential for recovery after cessation of discharge is unknown because of a lack of information on the forms, quantities, and persistence of chlorine reaction products.

- U.S. EPA believes that if permit conditions are met, the discharge is not likely to cause permanent and substantial harm to the marine environment. Monitoring is currently required to provide early detection of any adverse effects.

- Adverse impacts to human health are not expected, however, the potential for bioaccumulation of CRPs needs further evaluation.

Other Statutory Requirements:

- A consistency determination with the Alaska Coastal Zone Management Plan is required.

- The discharge must comply with State of Alaska water quality standards for total residual chlorine, total suspended solids, turbidity, temperature, sediment, and toxic substances.

- Determination of compliance with federal water quality criteria for priority pollutants, as well as the nonconventional pollutant chlorine, is required.

- U.S. EPA has concluded that the discharge will have no effect on any endangered or threatened species or its critical habitat and will therefore be in compliance with the Endangered Species Act.

REFERENCES

U.S. Environmental Protection Agency. 1986. NPDES Permit and Fact Sheet for ARCO Alaska, Inc. Application No. AK-002984-0. U.S. EPA Region X, Seattle, WA. 17 pp.

FACT SHEET ON CANE SUGAR MILLS SUBJECT TO 403(c)

How many are there?

There are approximately 8 cane sugar mills subject to 403(c) ocean discharge criteria in Hawaii. Information presented below is based on the Haina and Pepeekeo sugar mills located on the Hamakua coast of the island of Hawaii.

What are the typical effluent characteristics?

- Effluent is derived from the cane washing process and from processing the cane into raw sugar. This effluent contains primarily soil particles, grit, rocks, with leafy trash and small pieces of cane.
- The major pollutant is total suspended solids.
- Other pollutants may include floatable solids and BOD.
- Pollutants are considered conventional and non-toxic.
- In 1979, U.S. EPA imposed the following standards for total suspended solids in sugar mill effluent for the Hilo Coast and Hamakua processors:

  Daily maximum = 9.9 lb/1,000 lbs gross cane processed

  Monthly average = 3.6 lb/1,000 lbs gross cane processed
- From 1965 to 1979, the Haina Sugar Mill discharged approximately 49,410-130,410 tons of sediment annually. Annual sediment discharge was reduced to 3,621-5,400 tons in 1980-1982.

What is the behavior and fate of the effluent in the receiving water environment?

- Immediate discharge depths are shallow, but fall off rapidly to great depths (e.g., 500 ft in one mile).
- Shape and direction of the discharge plume is variable, depending primarily on tidal stage and wind. The plumes off both Pepeekeo and Haina extend southeasterly during ebb tides. The flow reverses direction and is stronger during flood tide, resulting in net effluent transport to the northwest. During periods of strong tradewinds, the wind-induced longshore current also transports the effluent plume to the northwest.
- The majority of discharged sediment is expected to settle within approximately 1 mi of the discharge site. Very fine sediments remain in suspension and are not expected to settle out before they reach deep water.
- Effluent treatment for sediment removal currently includes use of settling ponds (Pepeekeo Mill) or hydroseparators (Haina Mill). Polymers to increase sedimentation during treatment may also be added.

What are the primary physical, chemical, and biological impacts?

- Potential impacts to ambient water quality in the immediate vicinity of the discharge include increased temperature by approximately 1.0°C, decreased salinity by 1 to 5 ppt (parts per thousand), and decreased oxygen saturation by 0-5 percent. Substantial impacts to marine life due to these changes are not expected.
- Increased concentrations of suspended solids (up to 10 times background) has caused considerable impacts on the biota by increasing sedimentation rates and turbidity.
- Biological impacts include mortality of benthic infauna, changes in benthic species composition, and, because of changes in prey species availabi-

lity, alterations in fish communities.

- Special aquatic habitats occurring in the vicinity of the discharge include coral reef communities. Coral reefs are particularly sensitive to the effects of increased sedimentation. Impacts include mortality due to sedimentation, growth inhibition due to reduced light availability, reduced abundance and species diversity, and recruitment failure.

- Impacts on recreational fisheries are not well understood. There may be changes in fish abundance and species composition.

- Adverse impacts to human health are not expected.

- There is the potential for long term recovery (i.e., approximately 10 years) after cessation of the discharge.

Other Statutory Requirements

- As currently permitted, the discharge is expected to be in compliance with State of Hawaii water quality standards at the authorized mixing zone boundary.

- EPA is currently evaluating compliance with State water quality standards, including conventionals, metals, and herbicides.

REFERENCES

Andrews, D.R. 14 January 1988. Personal Communication. (letter to William H. Pierce, U.S. EPA Region IX). McCutchen, Doyle, Brown and Enersen, Counselors at Law, San Francisco, CA.

Grigg, R.W. 1985. Hamakua Coast Sugar Mill Ocean Discharges. Sea Grant Technical Report. University of Hawaii Sea Grant College Program, Honolulu, HI.

Tetra Tech. 1983. Ecological Impacts of Sewage Discharges on Coral Reef Communities. EPA-430/9-83-010 U.S. Environmental Protection Agency, Office of Water Program Operations, Office of Marine Discharge Evaluation. Washington, D.C.

U.S. Environmental Protection Agency. Developmental Document for Interim Final Effluent Limitations Guidelines and Proposed New Source Performance Standards for the Raw Cane Sugar Processing Segment of the Sugar Processing Point Source Category. Washington, D.C. February, 1975.

Federal Register. November 6, 1979. Volume 44, p. 64078. Notice of Revised BPT Effluent Limitations for the Hilo-Hamakua Coast of the Island of Hawaii Subcategory.

FACT SHEET ON PETROLEUM REFINERIES SUBJECT TO 403(c)

How many are there?

There are three major petroleum refineries subject to 403(c) ocean discharge criteria. The two major facilities are owned and operated by Chevron USA, Inc. and are located in El Segundo, CA and Ewa, Oahu, HI. A third major refinery, Union Oil in Santa Maria, CA, also discharges to the ocean. The information presented below was derived primarily from the NPDES permit for the El Segundo refinery (U.S. EPA 1984) and permit summaries from EPA's Abstracts of Industrial NPDES Permits (EPA, 1986).

What are the typical effluent characteristics?

- Effluent is derived from processing wastewater, non-contact cooling water, shallow recovery well groundwater, brine well water and surface water runoff containing contaminants. The El Segunda refinery also discharges wastewater from a marine terminal (e.g., ship ballast water, line displacement water).

- The effluent is treated prior to discharge. Treatment may include sedimentation, floatation, neutralization, air oxidation and oil/water separation.

- Average daily dry-weather flow from the El Segunda refinery is 4.39 million gallons per day (mgd). Average daily flow from the Ewa refinery (primary discharge only) is 1.348 mgd.

- Major pollutants include oil and grease and phenolic compounds. Other pollutants that may be present in the discharge are total suspended solids (TSS), ammonia, sulfide, and total and hexavalent chromium. Biological oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon, turbidity, and pH may also be affected.

- Contaminants include conventional, non-conventional, and toxic pollutants.

- The current permit requires weekly and monthly monitoring of the pollutants listed above. Metal and pesticide determinations and acute toxicity fish bioassays must be performed quarterly.

- There is a potential for bioaccumulation of toxic pollutants (e.g., chromium) in marine organisms.

What is the behavior and fate of the effluent in the receiving water environment?

- Outfalls extend 500-1000 ft offshore and discharge to shallow water (20-22 ft)

- Transport and dilution of the discharge plume is dependent on local circulation, wind and wave conditions, water column stratification and bottom topography of the receiving environment. Specific information for these facilities was not available.

What are the primary physical, chemical, and biological impacts?

- Beneficial uses of the receiving waters include: industrial supply, navigation, contact and non-contact water recreation, commercial and sport fishing, preservation of rare and endangered species, marine habitat and fish spawning areas.

- Potential water quality impacts include oxygen depletion, nutrient enrichment, increased sedimentation or turbidity, and elevated concentrations of oil and grease and priority pollutants.

- Possible impacts on the biological community include:

  - Changes in diversity or abundance of benthic

organisms due to changes in sediment characteristics(e.g, grain size, TOC) or deposition rate

- Benthic infauana mortality or stress due to chemical contamination
- Changes in the plankton community because of increased turbidity and reduced light penetration
- Alterations in fish communities due to changes in food availability

- Discharges are not allowed in areas with sensitive biological communities, threatened and endangered species, special aquatic sites or areas necessary for critical life stages or functions of an organism.

Other Statutory Requirements

- Objectives of the State Water Resources Control Board for Ocean Waters of California (Ocean Plan) and the Water Quality Control Plan for Los Angeles River Basin must be achieved.
- Water quality standards for the State of Hawaii must be achieved.
- Compliance with federal water quality criteria for priority pollutants and U.S. EPA guidelines and standards for petroleum-refining point sources (40 CFR Part 419) is required.

REFERENCES

U.S. EPA. 1984. NPDES Permit and Fact Sheet for Chevron USA, Inc. Application No. CA0000337. California Regional Water Quality Control Board, Los Angeles, CA.

U.S. EPA. 1986. Abstracts of Industrial NPDES Permits. Permits Division, NPDES Technical Support Branch.

FACT SHEET ON PULP AND PAPER MILLS (REGIONS IX AND X) SUBJECT TO 403(c)

How many are there?

Currently, there are two pulp and paper mills in Region IX and three in Region X that are subject to 403(c) ocean discharge criteria. The pulp and paper mills in Region IX include the Simpson Paper Company's bleached kraft pulp mill near Fairhaven, CA and the Louisiana-Pacific Company in Samoa, CA. Region X's pulp and paper mills are Georgia-Pacific's facility in Toledo, OR; International Paper's plant in Gardiner, OR; and Weyerhaeuser's facility in North Bend, OR. The information presented below was derived primarily from the NPDES permits for each facility and from Del Green and Associates and Tetra Tech (1984a,b). Information on the pulp mills in Region X (other than effluent characteristics) is extremely limited.

What are the typical effluent characteristics?

- The effluent generally consists of process wastewater from kraft pulping, pulp bleaching, and pulp drying. The effluent from the mill in Region IX also contains solids from their raw water treatment plant, power boiler effluent, treated sanitary sewage, and storm water. Louisiana-Pacific also discharges saw mill effluent.
- The kraft and sulfite chemical pulping processes produce effluents containing a wide range of resin acids, fatty acids, and chlorophenols.
- Effluent flows and mass loadings vary, depending on the type of operation, size of the facility, market factors, and the level of treatment achieved by the mill.
- Annual average effluent flows range from approximately 2-4 MGD (Weyerhaeuser) to 20 MGD (Simpson facility).
- Major pollutants are suspended solids, biochemical oxygen demand (BOD), priority pollutants, and other toxic substances. Pulp mill effluent is typically strongly acidic.
- The pulp mills in Region X have provided certification that slimicides containing trichlorophenol or pentachlorophenol are not used.
- Pulp mill effluent is composed of conventional pollutants and toxic pollutants that have variable rates of persistence in the receiving environment and that bioaccumulate (e.g., dioxin, mercury, resin acids)

What is the behavior and fate of the effluent in the receiving water environment?

- Effluent is discharged at water depths of 20-45 ft.
- Critical initial dilutions for the discharges are approximately 40-60:1.
- The nearshore environments into which the Simpson and Louisiana Pacific pulp mills discharge effluent are highly energetic.
- The majority of effluent solids remain suspended and are transported out of the immediate discharge area.
- Bottom velocities projected by both field and laboratory studies are adequate to resuspend sediments, preventing their long-term deposition. The relatively small increase in percent silt at stations near the Simpson discharge support this conclusion (Del Green Associates and Tetra Tech 1984a,b).

- The effluents from the Louisiana-Pacific and Simpson mills create highly visible plumes which are transported up and down the coast, entrained into the surf zone and sometimes into the bay.

What are the primary physical, chemical, and biological impacts?

- Potential impacts to water quality include increased suspended solids, increased turbidity, decreased light transmittance, reduced oxygen concentrations, and changes in pH.

- Information on concentrations of resin acids, fatty acids, and chlorophenols in estuarine and marine waters is very limited (McLeay and Associates 1987).

- Particulates deposited in the effluent wastefield may degrade water quality by causing oxygen depletion, altered substrate, or toxic conditions.

- Although most effluent solids are transported out of the immediate discharge area of the Region IX mill, higher proportions of silt and total volatile solids suggest that the effluent may be modifying sediment characteristics slightly, despite the rigorous physical environment.

- There is no evidence that pulp mill effluent has adversely impacted the fish or benthic communities near the discharges subject to 403(c) in Regions IX and X (see Del Green Associates and Tetra Tech 1984a,b; Oregon Department of Ecology NPDES Permits Nos. 3750-J, 3848-J, and 1000045).

- Acute toxicity is attributed primarily to resin and fatty acids, chlorinated phenols and, to a lesser extent a broad group of neutral compounds. Available data indicate that various types of treated and untreated effluent are acutely lethal to juvenile rainbow trout and other test organisms (D. McLeay and Associates 1987).

- Information concerning the sublethal effects of pulp mill effluents is extremely limited or absent (D. McLeay and Associates 1987).

- A variety of recreational and commercial fishing activities (including surfing, party boat fishing, trawling, crabbing, and a red-tailed surfperch fishing) occur in the vicinity of the Simpson outfall. The Dungeness crab fishery is most likely to be affected by mill discharges because of its proximity to the outfalls.

- Current knowledge concerning the bioaccumulation and retention in aquatic life of pulp mill effluent constituents is sparse. Laboratory and field studies have demonstrated that resin acids can accumulate to an appreciable extent in certain tissues (e.g., blood plasma, liver, kidney, brain) of aquatic biota. A limited number of field investigations have also reported elevated concentrations of chlorinated phenolic compounds in fish and shellfish collected from freshwater, estuarine, and marine sites. EPA is currently conducting a National Bioaccumulation Study including analysis of several bleached kraft pulp mills. Fish tissue samples collected downstream of pulp and paper mills have consistently shown 2378-TCDD (i.e., dioxin) contamination.

- Evidence of off-flavors in edible aquatic life attributable to mill discharges were restricted to receiving waters where effluent mixing and dilution were minimal.

- Extensive receiving water data is available in reports from the Louisiana and Simpson mills and can be reviewed for more impact data.

Other Statutory Requirements

- Pulp mills must comply with all state effluent requirements and water quality standards. Requirements for mills in CA are specified in the California Ocean Plan. Pulp mills in CA appear to be in violation with limitations specified in the 1983 Ocean Plan, with the exception of light transmittance.

- Pulp mill discharges must demonstrate compliance with U.S. EPA water quality criteria. A definitive conclusion regarding violation of water quality criteria for some pollutants (e.g., mercury, dieldrin) could not be made in the technical review performed by Del Green Associates and Tetra Tech (1984a,b) for the CA

pulp mills.

- The U.S. Fish and Wildlife Service concluded that the CA pulp mills were in compliance with the Endangered Species Act. No listed or endangered species are found in the discharge area. Gray whales may migrate through the discharge area, but are not likely to be adversely impacted by the discharges.

- Congress amended the Clean Water Act to add section 301(m) which allows the Louisiana Pacific and Simpson facilities to discharge without wastewater treatment. These are the only two mills in the country which are allowed to discharge without treatment. Both mills have been cited for violations of their 301(m) permit. Upon expiration of the current permits, EPA must decide whether or not to renew the 301(m) waivers.

- An additional limitation imposed by the Oregon Department of Environmental Quality on Weyerhaeuser's discharge prohibits pulp mill discharges during the period of April 1 to June 30, except on a case-by-case basis, to provide further protection to the critical stage of bivalve larvae.

REFERENCES

Del Green Associates and Tetra Tech. 1984b. Simpson Paper Company 301(m) application. Draft Technical Review Report. Prepared for U.S. Environmental Protection Agency, Washington, DC.

D. McLeay and Associates. 1987. Aquatic toxicity of pulp and paper mill effluent: a review. Prepared for Environment Canada, Ontario, Canada. Report E

FACT SHEET ON SAWMILLS SUBJECT TO 403(c)

How many are there?

Georgia-Pacific operates a sawmill in Ft. Bragg, CA that is subject to 403(c) regulations. The information presented below was derived primarily from the NPDES permit for this facility.

What are the typical effluent characteristics?

- The effluent discharge is from millpond overflow. Total daily discharge consists of approximately 1.08 mgd debarker water, 20,000 mgd boiler blowdown, and up to 1.3 mgd stormwater runoff from log decks and the City of Fort Bragg.
- Major pollutants include cyanide, settleable matter, coliform bacteria, and changes in turbidity and pH.
- Other pollutants that may be present in the discharge include ammonia (nitrogen), biological oxygen demand (BOD), total suspended solids (TSS), and grease and oil. These contaminants include both conventional pollutants and toxic pollutants (i.e., cyanide).
- Current permit limits require that cyanide concentrations in the discharge not exceed six-month median, daily maximum and instantaneous maximum levels of 0.005 mg/L, 0.020 mg/L, and 0.050 mg/L, respectively. Acute toxicity fish bioassays are required monthly.
- Stormwater runoff from the City of Fort Bragg is a possible source of coliform bacteria in the discharge.
- Discharge of woody debris or process wastewater is prohibited.

What is the behavior and fate of the effluent in the receiving water environment?

- Transport and dilution of the discharge plume is dependent on circulation, wind and wave conditions, water column stratification and bottom topography of the receiving environment.

What are the primary physical, chemical, and biological impacts?

- Beneficial uses of the receiving waters include: navigation, contact and non-contact recreation, commercial and sport fishing, wildlife and marine habitat, habitat for rare and endangered species, fish migration and spawning, and shellfish harvesting.
- Potential water quality impacts include oxygen depletion, nutrient enrichment, increased sedimentation or turbidity, and elevated concentrations of oil and grease and priority pollutants.
- Possible impacts on the biological community include:
  - Changes in diversity or abundance of benthic organisms due to changes in sediment characteristics(e.g, grain size, TOC) or deposition rate
  - Benthic infauana mortality or stress due to chemical contamination
  - Changes in the plankton community because of increased turbidity and reduced light penetration
  - Alterations in fish communities due to changes in food availability
- Discharges are not allowed in areas with sensitive biological communities, threatened and endangered species, special aquatic sites or areas

necessary for critical life stages or functions of an organism.

- Protection of recreational boating, fishing, and shellfish harvesting in Fort Bragg Cove requires effluent limitations for fecal coliform bacteria that are more restrictive than those specified in the California Ocean Plan.

- U.S. EPA has determined that there will be no adverse effects on receiving water quality if the discharge is in conformance with current permit limitations.

Other Statutory Requirements

- The discharge must comply with California State water quality standards (i.e., the California Ocean Plan).

- Determination of compliance with federal water quality criteria for priority pollutants (e.g., cyanide) is also required.

REFERENCES

U.S. Environmental Protection Agency. No date. NPDES Permit for Georgia-Pacific Corp., Fort Bragg Lumbermill. Application No. CA 0005304. California Regional Water Quality Control Board, North Coast Region, Santa Rosa, CA. 12 pp.

Appendix D

List of "Definite" 403(c) Discharges Under Individual NPDES Permits

LIST OF DEFINITE 403(c) DISCHARGES

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
1	MA0005118	NANTUCKET GAS & ELECTRIC	4911	4.1	MINOR	/ /	12/11/79	10/01/80
1	MA0005916	WOODS HOLE OCEANOGRAPHIC INSTN	8733	0.1	MINOR	/ /	3/03/78	3/31/83
1	MA0090182	NATL MARINE FISHERIES-AQUARIUM	8731	0.1	MINOR	/ /	9/28/79	9/28/84
1	MA0090654	(US) CG LTSA-CAPE ANN	9621	0.1	MINOR	/ /	7/23/82	7/23/87
1	MA0100081	GOSNOLD	4952	1	MINOR	/ /	9/30/86	9/30/91
1	MA0100145	ROCKPORT MTP	4952	0.45	MAJOR	/ /	6/27/85	6/27/90
1	MA0101605	DARTMOUTH WPCF	4952	0.4	MAJOR	/ /	12/07/84	12/07/89
1	MA0101737	MARSHFIELD	4952	0.12	MAJOR	/ /	12/31/87	12/31/92
1	ME0000388	MCCURDY FISH CO.	2091	0.024	MINOR	/ /	5/01/80	3/31/81
1	ME0000523	R.J. PEACOCK CANNING CO.	2091	0.08	MINOR	/ /	8/07/80	3/31/81
1	ME0000795	STONINGTON CANNING CO.	2091	0.27	MINOR	/ /	5/01/80	3/31/81
1	ME0020826	CLIFF HOUSE AND HOTEL	7011	0.1	MINOR	/ /	2/08/76	9/01/80
1	ME0021229	PINE TREE CONSERVATION SOCIETY	7011	0.1	MINOR	/ /	12/11/75	12/01/80
1	ME0021563	ISLAND RETREAT ASSOCIATION	4953	0.1	MINOR	/ /	5/12/75	5/01/80
1	ME0022608	STINSON CANNING (LUBEC)	2091	0.061	MINOR	/ /	2/14/78	2/14/83
1	ME0022632	QUADDY PACKING COMPANY	2091	0.016	MINOR	/ /	1/17/78	1/17/83
1	ME0022951	MAINE PEARL ESSENCE		0.1	MINOR	/ /	9/26/86	9/26/91
1	ME0090034	ACADIA NATIONAL PARK (SEAWALL)	9512	0.1	MINOR	/ /	5/01/80	5/01/85
1	ME0090051	NAVAL SECURITY GROUP-WINTER	9711	0.1	MINOR	/ /	5/01/80	5/01/85
1	ME0090328	(US) CG LS-BASS HARBOR	9621	0.1	MINOR	/ /	5/29/74	5/01/79
1	ME0090417	(US) CG LS-W QUODOY HEAD	9621	0.1	MINOR	/ /	5/08/79	5/08/84
1	ME0100200	EASTPORT CITY OF	4952	0.479	MINOR	/ /	12/31/85	12/31/90
1	ME0100790	WELLS SANITARY DISTRICT	4952	0	MAJOR	/ /	3/26/85	3/26/90
1	ME0100986	OGUNQUIT SEWER DISTRICT	4952	0	MAJOR	/ /	4/12/85	4/12/90
1	ME0101052	JONESPORT TOWN OFFICE	6513	0.1	MINOR	/ /	6/28/86	3/28/91
1	ME0101338	MOUNT DESERT (OTTER CREEK)	4952	0	MINOR	/ /	2/12/86	3/14/91
1	ME0101354	MOUNT DESERT-SEAL HARBOR STP	4952	0.17		/ /	/ /	/ /
1	ME0101770	MSAD #8-LINCOLN SCHOOL WTP	8211	0.1	MINOR	/ /	6/29/87	6/29/92
1	ME0102016	LUBEC, TOWN OF	4952	1	MINOR	/ /	12/31/85	12/31/90
1	ME0102148	EASTPORT (QUODDY VILLAGE)	4952	0.1	MINOR	/ /	9/30/86	9/30/91
1	ME0101851	STONINGTON SANITARY DISTRICT	4952	0.479	MINOR	/ /	6/30/77	2/15/82
1	ME0102172	KENNEBUNKPORT, TOWN OF	4952	0.012	MINOR	/ /	3/28/86	3/28/91
1	NH0020338	SEABROOK 1 & 2	4911	1200	MAJOR	/ /	7/26/85	7/26/90
1	NH0020966	WALLIS SANDS STATE PARK	9512	0.1	MINOR	/ /	10/27/81	10/27/86
1	NH0101184	RYE	4952	1	MINOR	/ /	2/29/84	2/28/89
1	NH0101303	SEABROOK, TOWN OF	4952	1	MINOR	/ /	/ /	/ /
1	RI0090131	(US) CG STA-PT JUDITH	9711	0.1	MINOR	/ /	4/04/86	4/04/91
1	RI0100196	NEW SHOREHAM	4952	0.19	MINOR	/ /	12/09/85	12/09/90
2	NJ0004120	TOMS RIVER CHEM CORP	DYES	5		10/31/74	5/08/85	6/30/90
2	NJ0024473	ATLANTIC COUNTY SA	4952	18.37	MAJOR	6/28/74	2/19/85	1/31/90
2	NJ0024520	TOWNSHIP OF OCEAN SA	4952	3.64	MAJOR	9/30/74	9/28/84	10/07/89
2	NJ0024562	SOUTH MONMOUTH REGIONAL	4952	2.92	MAJOR	1/31/75	7/31/85	8/31/90
2	NJ0024694	MONMOUTH COUNTY BAYSHOR	4952	33	MAJOR	11/29/74	8/16/85	9/30/90
2	NJ0024708	BAYSHORE REGION SA	4952	8	MAJOR	11/30/74	11/07/85	12/31/90
2	NJ0024783	LONG BRANCH SEWERAGE AU	4952	3.98	MAJOR	6/28/74	7/23/87	4/30/90
2	NJ0024872	TOWNSHIP OF NEPTUNE STP	4952	3.97	MAJOR	6/30/74	1/03/86	2/28/91
2	NJ0025241	CITY OF ASBURY PARK	4952	3	MAJOR	7/31/74	3/28/86	4/30/91
2	NJ0025356	TOWNSHIP OF MIDDLETOWN SA	4952	10.8	MAJOR	11/30/74	11/14/85	12/31/90
2	NJ0026018	OCEAN COUNTY UTILITIES	4952	20	MAJOR	6/30/75	11/27/95	12/31/90
2	NJ0026735	NE MONMOUTH CITY REGION	4952	6.59	MAJOR	3/31/75	1/22/86	2/28/91
2	NJ0028142	OCEAN COUNTY SEWERAGE A	4952	28	MAJOR	7/31/75	10/28/85	11/30/90
2	NJ0029408	OCEAN COUNTY SEWERAGE A	4952	2.95	MAJOR	5/31/77	8/31/88	9/30/90
2	NJ0035343	OCEAN CITY WASTE WTF	4952	6.3	MAJOR	6/28/84	6/28/85	8/14/89
2	NJ0052990	CAPE MAY CO-7 MILE BEACH	4952	7.67	MAJOR	/ /	PNI	PNI
2	NY0026859	NASSAU COUNTY DPW CEDAR	4952	76	MAJOR	1/31/75	9/30/85	10/01/90
2	NY0104809	SUFFOLK COUNTY SD#3-SOUTHWEST	4952	1	MAJOR	7/01/82	7/13/88	8/01/93
2	PR0000094	NEPTUNE PACKING	FRES	0.694		/ /	/ /	/ /
2	PR0000167	CORP AZUCARERA DE PUERTO RICO	2061	31.38	MAJOR	4/26/74	12/30/85	1/31/91
2	PR0000183	BUMBLEBEE	FRES	1.115		/ /	/ /	/ /
2	PR0000230	NATIONAL PACKING	FRES	2.44		/ /	/ /	/ /
2	PR0000299	STARKIST CARIBE	FRES	2		/ /	/ /	/ /
2	PR0000342	COMMONWEALTH OIL PETROCHEMICAL	PETR	62	MAJOR	12/31/74	9/18/86	11/30/91
2	PR0000345	COMMONWEALTH OIL PETROCHEMICAL	PETR	14.9	MAJOR	12/31/74	9/18/86	11/30/91

LIST OF DEFINITE 403(c) DISCHARGES

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
2	PR0000400	YABUCOA SUN OIL CO.	2911	4	MAJOR	12/31/75	11/01/83	11/30/88
2	PR0000418	UNION CARBIDE CARIBE INC	2869	.	MAJOR	12/31/74	11/30/74	12/31/79
2	PR0000591	BACARDI CORP.	RUM	0.4	MAJOR	7/31/74	2/28/81	2/28/86
2	PR0000655	BACARDI CORP.	RUM	0.07		/ /	/ /	/ /
2	PR0000680	P.R. DISTILLERS	RUM	1		/ /	/ /	/ /
2	PR0001031	PUERTO RICO ELECTRIC PWR AUTHORITY	4911	650	MAJOR	10/31/75	12/31/83	1/31/89
2	PR0001660	AGUIRRE	4911	652	MAJOR	11/30/76	12/31/83	1/31/89
2	PR0001147	SOUTH COAST 1-6	4911	665		/ /	/ /	/ /
2	PR0020010	ROOSEVELT ROADS NAVAL S	9711	2		/ /	/ /	/ /
2	PR0020044	U.S. NAVY COMMUNICATION	9711	0.17	MINOR	9/30/74	8/30/74	9/30/79
2	PR0020231	PRASA MARABELLA I	4952	0.14		/ /	/ /	/ /
2	PR0020265	PRASA MARABELLA II	4952	3.5		8/30/82	/ /	9/30/87
2	PR0020486	PRASA GUANICA	4952	0.33	MINOR	5/13/74	8/30/82	9/30/87
2	PR0020516	PRASA HATILLO	4952	0.5	MINOR	5/31/74	12/26/84	2/28/90
2	PR0020656	PRASA MAUNABO	4952	0.3		/ /	/ /	/ /
2	PR0020788	PRASA RINCON	4952	0.28	MINOR	5/31/74	8/30/82	9/30/87
2	PR0020931	PRASA VIEQUES	4952	0.163	MINOR	4/30/75	8/01/88	9/29/93
2	PR0021105	SUN HARBOR CARIBE	FRES	1.32	MAJOR	9/30/74	9/30/86	11/30/91
2	PR0021237	PRASA BARCELONETA	4952	8.33	MAJOR	8/01/77	3/31/88	6/01/93
2	PR0021539	HERITAGE COMMUNITIES	CAMP	0.1	MINOR	7/31/78	6/30/78	7/31/83
2	PR0021563	PRASA PONCE STP	4952	12	MAJOR	9/30/80	9/30/85	10/31/90
2	PR0021776	PRASA RAMEY STP	4952	2.5	MAJOR	8/31/81	7/31/81	8/31/86
2	PR0021954	NEPTUNE PACKING CORP	2091	0.015	MAJOR	7/31/76	9/25/86	11/30/91
2	PR0021962	V.C.S NATIONAL PACKING CO.	2091	1.73	MAJOR	6/15/76	9/25/86	11/30/91
2	PR0022012	STAR KIST CARIBE INC.	2091	2	MAJOR	10/31/76	9/24/86	11/30/91
2	PR0022055	PRASA GUAYAMA	4952	1	MINOR	/ /	/ /	/ /
2	PR0022063	PRASA AQUADILLO	4952	1	MINOR	/ /	/ /	/ /
2	PR0022071	Prasa Arecibo	4952	1	MINOR	/ /	/ /	/ /
2	PR0022080	PRASA ISABELLA	4952	1	MINOR	/ /	/ /	/ /
2	PR0022098	PRASA ARROYO	4952	0.7	MINOR	3/27/87	3/27/87	5/14/92
2	PR0022110	BUMBLE BEE PUERTO INC.	2091	2.5	MAJOR	10/31/76	3/27/87	5/31/92
2	PR0022250	PRASA ISABELLA	4952	1	MAJOR	6/30/77	8/01/88	9/29/93
2	PR0022284	SK&F LAB CORP	2834	0.108	MAJOR	2/28/78	1/28/78	6/30/81
2	PR0022322	PHILLIPS PUERTO RICO CORE INC	4463	2.1	MAJOR	6/30/86	6/30/86	9/01/91
2	PR0023027	PRASA VILLA TAINA	4952	0.11	MINOR	/ /	12/26/84	2/28/90
2	PR0023043	MAYAGUEZ WATER TREATMENT CO. INC.	2091	4.32	MAJOR	7/01/77	9/30/86	11/30/91
2	PR0023116	SECOND UNIT PASTILLO	8211	0.01	MINOR	11/30/79	8/12/88	8/31/93
2	PR0023710	PRASA ARECIBO	4952	10	MAJOR	9/30/83	9/30/88	11/29/93
2	PR0023728	PRASA BAYAMON	4952	25	MAJOR	9/30/82	8/01/88	9/29/93
2	PR0023736	PRASA AQUADILLA	4952	8	MAJOR	9/30/83	9/30/88	11/29/93
2	PR0023744	PRASA CANURY	4952	3.02	MAJOR	11/30/82	9/30/88	11/29/93
2	PR0023752	PRASA CAROLINA	4952	45	MAJOR	9/30/87	9/30/87	11/29/92
2	PR0023761	PRASA SANTA ISABEL	4952	1	MAJOR	9/30/83	9/30/88	11/29/93
2	PR0023795	PRASA MAYAGUEZ R W W T P	4952	22.5	MAJOR	9/30/87	9/30/87	11/29/92
2	PR0023850	PRASA DORADO	4952	8.45		/ /	PNI	PNI
2	PR0023876	PRASA FAJARDO	4952	6.6		/ /	PNI	PNI
2	PR0024724	AYERST-WYETH PHARMACEUTICALS	2834	0.21	MAJOR	/ /	10/01/84	10/31/89
2	VI0000060	V. I. WATER AND POWER AUTHORITY	4911	10	MAJOR	7/31/76	9/13/85	10/31/90
2	VI0020036	DEPT OF PUB WORKS-ST CROIX	4952	4	MAJOR	7/01/79	11/01/88	10/31/93
2	VI0020052	VIRGIN ISLANDS RUM IND.	2085	0.11	MAJOR	3/31/75	5/07/86	6/22/91
2	VI0020125	DEPT OF PUB WORKS-NADIR ESTATE	4952	0.25	MINOR	5/01/80	12/18/82	1/17/88
2	VI0020150	FEDERAL AVIATION ADMINISTRATION	4582	0.01	MINOR	8/29/77	10/31/83	11/30/88
2	VI0039829	FRENCHMAN'S REEF-HOLIDAY INN	4952	2	MINOR	4/10/79	12/18/82	1/17/88
2	VI0039837	CANEEL BAY-ST JOHN	7011	0.265	MINOR	4/10/79	6/22/88	7/13/93
2	VI0039853	COWPET BAY WEST	7011	0.035	MINOR	9/01/79	9/13/88	9/27/93
2	VI0039870	AMERICAN YACHT HARBOR ASSOCIATION	4582	0.1	MINOR	1/02/80	11/01/83	11/30/88
2	VI0039900	COWPET BAY EAST ASSOCIATION	4952	1	MINOR	1/18/83	1/18/83	1/17/88
2	VI0039934	SAPPHIRE BAY WEST CONDO ASSOC	4952	1	MINOR	1/18/83	12/18/82	1/17/88
2	VI0039942	DEPT OF PUB WORKS-CRUZ BAY	4952	0.1	MINOR	1/18/83	12/18/82	1/17/88
2	VI0040037	GALLOWS POINT DEVELOPMENT CORP.	4953	0.1	MINOR	/ /	/ /	/ /
2	VI0040088	YACHT HAVEN HOTEL AND MARINA	4953	0.03	MINOR	/ /	11/17/84	12/31/89
2	VI0040096	FRANK MCCARTHY	4953	0.004	MINOR	/ /	11/23/84	1/07/90
2	VI0040126	JOHN MCVIE	6514	0.004	MINOR	1/11/85	1/11/85	3/15/90
2	VI0040134	WATERGATE VILLAS EAST ASSN.	6514	0.066	MINOR	1/11/85	1/11/85	3/15/90

LIST OF DEFINITE 403(c) DISCHARGES (continued)

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
2	VI0040177	SEA CLIFF BEACH RESORT	4953	0.02	MINOR	/ /	7/14/88	7/14/93
2	VI0040185	D & C DEVELOPMENT INC	4952	1	MINOR	/ /	3/14/86	3/14/91
2	VI0040193	WATER BAY MANAGEMENT CORP. BDA	7011	0.1	MINOR	/ /	3/14/86	3/14/91
2	VI0040215	K R DEVELOPMENT CORP	9999	0.1	MINOR	/ /	2/13/87	11/30/87
2	VI0040291	CORAL WORLD INC	4953	0.001	MINOR	2/12/88	1/12/88	3/01/90
2	VI0040312	BAYSIDE RESORT	4953	0.057	MINOR	/ /	6/22/88	6/22/93
2	VI0110027	U.S. NAVY SUPPLY DEPOT	9711	0.37		/ /	/ /	/ /
3	DE0050008	SOUTH COASTAL REGIONAL	4952	6	MAJOR	/ /	9/30/86	9/29/91
3	MD0020044	WORCHESTER CO. SANITARY COMMIS.	4952	12	MAJOR	/ /	3/20/85	2/28/90
3	MD0021091	US DEPT. OF INTRIOR-ASSATEAQUE	7999	0.017	MINOR	/ /	10/20/87	10/20/92
3	MD0023477	MARYLAND MARINE UTILITIES	4952	1	MINOR	/ /	9/01/86	7/31/91
3	MD0024911	BERLIN SHOPPING CENTER WWTP	5411	0.004	MINOR	/ /	5/12/83	3/31/88
3	VA0031917	FORT STORY-US ARMY TRANSPORT	4952	1	MINOR	/ /	8/30/85	8/30/90
3	VA0062618	HAMPTON ROADS SANITARY DISTRICT	4952	36	MAJOR	/ /	7/12/83	7/12/88
4	FL0000159	CRYSTAL RIVER 1-3	4911	1970		/ /	9/01/88	9/30/93
4	FL0002208	ST. LUCIE 1	4911	763		/ /	9/30/87	10/31/92
4	FL0024805	VIRGINIA KEY	4952	133	MAJOR	/ /	10/07/88	11/30/93
4	FL0025976	KEY WEST	4952	5	MAJOR	/ /	6/22/84	6/30/89
4	FL0026255	HOLLYWOOD	4952	31.72	MAJOR	/ /	9/10/85	9/30/90
4	FL0026344	BOCA RATON	4952	11.8	MAJOR	/ /	9/10/85	9/30/90
4	FL0029289	GEIGER KEY MARINA	MARI	0.005		/ /	3/05/85	6/12/90
4	FL0031186	SINGLETON SHRIMP	FRES	0.023		/ /	9/29/86	9/30/91
4	FL0031771	BROWARD COUNTY	4952	66	MAJOR	/ /	9/10/85	9/30/90
4	FL0032182	MIAMI-DADE NO. DISTRICT	4952	80	MAJOR	/ /	8/10/87	9/14/92
4	FL0033847	COCONUT GRVE TRAIL. PK	TRAI	0.006		/ /	8/13/84	8/31/89
4	FL0033855	WALES EDGE COLONY	TRAI	0.0075		/ /	8/13/84	8/31/89
4	FL0033901	SEABREEZE TRAILER PARK	TRAI	0.0075		/ /	8/10/84	8/31/89
4	FL0034924	VENTURE OUT IN AMERICA	TRAI	0.07		/ /	2/17/84	2/28/89
4	FL0035025	MAN-O-WAR HOTELS	TRAI	0.005		/ /	8/10/84	8/31/89
4	FL0035068	BOYD'S CAMPGROUND	TRAI	0.02		/ /	12/20/83	12/31/88
4	FL0035793	MARATHON SEAFOODS	FRES	0.0001		/ /	9/18/88	9/30/90
4	FL0035980	DEL RAY BEACH	4952	24	MAJOR	/ /	8/31/88	9/30/93
4	NC0007064	BRUNSWICK 1-2	4911	2000		/ /	4/28/87	3/31/92
6	LA0049492	LOOP INC. (LA OFFSHORE OIL PORT)	5171	2.17		5/02/85	N/A	5/01/90
6	LA0049492	LOOP INC. (LA OFFSHORE OIL PORT)	BRIN	25.2		5/02/85	N/A	5/01/90
6	LA0053031	HACKBERRY STRATEGIC OIL STORAGE	5171	1		8/24/84	PENDING	8/21/89
6	LA0068250	FREEPORT SULPHUR CAMINADA MINE	1477	4.3	MAJOR			
6	LA0078646	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078654	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078662	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078671	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078689	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078697	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078701	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078719	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078727	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078735	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	LA0078743	FREEPORT SULPHER-SHALLOW EXPL WELL	1477	1		11/03/88	N/A	11/02/93
6	TX0074012	STRATEGIC PETROLEUM RES	BRIN	42.07		6/04/85	PENDING	2/02/89
6	TX0092827	BIG HILL STRATEGIC PETROLEUM RES	BRIN	71.4		1/18/84	PENDING	1/18/89
9	AS0000019	STAR-KIST	2091	1.25	MAJOR	7/16/74	3/ /87	3/ /92
9	AS0000027	SAMOA PACKING CO.	2091	0.52	MAJOR	5/10/75	3/ /87	3/ /92
9	AS0020001	ASPA, UTULEI STP, AS	4952	0.57	MAJOR	5/22/75	11/ /85	11/ /90
9	AS0020010	ASRA, TAFUNASTP, A.S	4952	0.95	MAJOR	5/27/75	6/ /85	6/ /90
9	AS0020036	MARINE RAILWAY AUTH.	3731	0.1	MINOR	4/12/76	9/ /83	9/ /88
9	CA0000051	UNION OIL	PETR	0.312	MAJOR	/ /	6/12/87	6/30/91
9	CA0000230	CHEVRON	OIL	0.68	MAJOR	/ /	1/16/87	1/01/92
9	CA0000337	CHEVRON	PETR	6.61	MAJOR	/ /	11/19/84	11/10/89
9	CA0000353	HAYNES 1-6	4911	712.5	MAJOR	/ /	11/19/84	6/10/89
9	CA0000361	HARBOR 1-5	4911	199.5	MAJOR	/ /	11/19/84	6/10/89
9	CA0000370	SCATTERGOOD 1-3	4911	319.7	MAJOR	/ /	11/19/84	6/10/89
9	CA0000761	CONTINENTAL OIL	OIL	0.76		12/16/74	6/25/84	6/10/89
9	CA0001139	ALAMITOS 1-6	4911	987.9	MAJOR	/ /	11/19/84	8/10/89
9	CA0001147	EL SEGUNDO 1-4	4911	297.17	MAJOR	12/26/74	11/19/84	8/10/89

LIST OF DEFINITE 403(c) DISCHARGES (continued)

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
9	CA0001163	HUNTINGTON BEACH 1-4	4911	349.9	MAJOR	/ /	9/11/87	9/01/92
9	CA0001171	LONG BEACH 10-11	4911	112.12	MAJOR	/ /	11/19/84	8/10/89
9	CA0001180	MANDALAY 1-2	4911	245.8	MAJOR	/ /	11/19/84	8/10/89
9	CA0001198	ORMOND BEACH 1-2	4911	0.475	MAJOR	/ /	11/19/84	8/10/89
9	CA0001201	REDONDO BEACH 1-8	4911	567.3	MAJOR	/ /	11/19/84	8/10/89
9	CA0001228	SAN ONOFRE 1	4911	461	MAJOR	12/09/74	8/02/88	7/01/91
9	CA0001350	ENCINA 1-5	4911	1150	MAJOR	12/19/74	1/28/85	1/28/90
9	CA0001376	SILVERGATE 1-4	4911	170	MAJOR	12/09/74	1/28/85	1/28/90
9	CA0001384	STATION B 1-4	4911	120		12/09/74	1/28/85	1/28/90
9	CA0002305	UNION OIL	OIL	0.08		10/10/75	9/16/85	9/01/90
9	CA0003743	MORRO BAY 1-4	4911	539.6	MAJOR	/ /	2/08/85	2/01/90
9	CA0003751	DIABLO CANYON 1-2	4911	782.8	MAJOR	/ /	7/12/85	7/01/90
9	CA0005282	CROWN SIMPSON	PULP	18.37	MAJOR	/ /	7/19/87	8/18/92
9	CA0005304	GEORGIA PACIFIC	SAW	0.98	MINOR	/ /	7/27/84	7/27/89
9	CA0005622	HUMBOLDT	4911	2.2	MAJOR	/ /	6/24/87	6/24/92
9	CA0005894	LOUISIANNA PACIFIC	PULP	16.4				
9	CA0022756	CRESCENT CITY	4952	1.4	MAJOR	2/02/74	1/19/84	1/19/89
9	CA0022870	MENDOCINO	4952	0.3	MAJOR	4/06/74	12/09/83	12/09/88
9	CA0023078	FORT BRAGG	4952	5	MAJOR	4/06/74	10/25/84	10/25/89
9	CA0024040	MENDOCINO	4952	0.08		6/24/76	1/30/86	1/30/89
9	CA0024333	UCLA, BODEGA MAIN LAB	4952	0.25		9/28/78	4/23/84	4/23/89
9	CA0037494	PACIFICA	4952	2.26	MAJOR	12/10/74	6/20/84	6/20/89
9	CA0037681	SAN FRANCISCO (RICHMOND	4952	21.8	MAJOR	12/16/74	7/18/84	7/18/89
9	CA0037737	NORTH SAN MATEO	4952	14	MAJOR	9/27/74	6/20/84	6/20/89
9	CA0047364	CARPINTERIA	4952	1.3	MAJOR	7/12/74	10/12/84	7/01/89
9	CA0047830	AVILA	4952	0.18		11/08/74	2/14/86	6/01/89
9	CA0047881	MORRO BAY	4952	1.65	MAJOR	4/20/74	2/24/84	2/24/89
9	CA0047899	MONTECITO	4952	1	MAJOR	11/18/74	2/06/87	2/01/92
9	CA0047961	SAN SIMEON	4952	0.15		4/19/74	2/06/87	2/01/92
9	CA0047988	MARINA	4952	0.78	MAJOR	6/14/74	4/20/79	4/30/89
9	CA0047996	CARMEL	4952	0.66	MAJOR	4/29/74	4/12/85	4/01/90
9	CA0048003	SOUTH SAN LUIS OBISPO	4952	2.5	MAJOR	6/24/74	11/14/86	9/02/91
9	CA0048054	SUMMERLAND	4952	0.08		7/12/74	1/08/88	1/01/93
9	CA0048143	SANTA BARBARA	4952	7.57	MAJOR	4/29/74	2/14/86	5/18/89
9	CA0048151	PISMO BEACH	4952	1.2	MAJOR	11/18/74	7/10/87	7/18/92
9	CA0048160	GOLETA	4952	6.53	MAJOR	6/24/74	10/30/85	9/06/90
9	CA0048194	SANTA CRUZ	4952	13.4	MAJOR	7/22/79	11/18/83	10/01/88
9	CA0053651	SAN BUENAVENTURA	4952	14	MAJOR	9/28/74	3/19/84	3/10/89
9	CA0053813	LOS ANGELES COUNTY SANI	4952	351.1	MAJOR	12/26/74	7/07/77	6/10/82
9	CA0053856	LOS ANGELES (TERMINAL I	4952	20	MAJOR	12/26/74	7/07/77	7/01/83
9	CA0054097	OXNARD	4952	18.3	MAJOR	12/16/74	9/28/87	9/10/92
9	CA0054372	AVALON	4952	0.75	MAJOR	9/16/74	8/26/85	8/10/90
9	CA0056201	REYNOLDS METALS	ALUM	0.05		10/21/74	3/25/85	3/10/90
9	CA0105660	BOATSWAINS LOCKER	3731	0.003	MINOR	6/13/75	5/10/85	5/01/90
9	CA0107409	SAN DIEGO	4952	130.9	MAJOR	11/14/74	3/04/85	6/30/88
9	CA0107417	SERRA	4952	9	MAJOR	9/26/74	8/29/88	8/29/93
9	CA0109991	LOS ANGELES (HYPERION W	4952	404	MAJOR	12/18/74	7/23/87	7/10/92
9	CA0110078	U.S. NAVY CENTERVILLE B	9711	0.025		2/09/75	7/26/79	7/26/84
9	CA0110175	U.S. NAVY UNDERSEA CENT	9711	0.025		3/15/74	7/29/79	7/10/89
9	CA0110591	U.S. NAVY FUEL AND AMMO	9711	0.15		10/20/74	10/23/78	7/31/79
9	CA0110604	ORANGE COUNTY S.D.	4952	232.2	MAJOR	6/07/74	2/22/85	2/21/90
9	CA0111015	U.S. NAVY SUPPLY PT. LO	9711	0.05		10/30/75	10/23/78	9/22/87
9	CA0111135	U.S. ARMY NIKE SITE 88S	9711	0.01		10/31/73	10/31/78	10/01/79
9	GU0000019	USN, PITI PWR PLT	4911	182	MAJOR	2/10/75	11/ /88	11/ /93
9	GU0000027	GPA, TANGUISSON POWER PLANT	4911	99	MAJOR	2/10/75	10/ /88	10/ /93
9	GU0000035	U.S. NAVY GUAM SHIP REP	9711	0.012	MINOR	6/16/75	9/27/82	7/31/87
9	GU0020001	GPA, CABRAS POWER PLANT	4911	173	MAJOR	2/10/75	10/ /88	10/ /93
9	GU0020036	MOBIL CABRAS	5171	0.0004	MINOR	5/09/75	9/ /84	5/ /89
9	GU0020079	ESSO EASTERN INC.	5171	0.0004	MINOR	11/17/75	9/ /82	7/ /87
9	GU0020087	PUAG AGANA BAY, AGANA	4952	10	MAJOR	/ /	6/ /86	6/ /91
9	GU0020109	PUAG COMMERCIAL PORT-ST	4952	0.05	MINOR	3/25/76	9/ /83	9/ /88
9	GU0020141	PUAG NORTH DISTRICT WTP	4952	12	MAJOR	9/30/83	6/ /86	6/ /91
9	GU0020168	UNIVERSITY OF GUAM	8421	0.288	MINOR	10/12/77	8/ /83	8/ /88
9	GU0020222	PUAG AGAT SANTA RITA ST	4952	0.75	MAJOR	/ /	9/ /87	9/ /92

LIST OF DEFINITE 403(c) DISCHARGES (continued)

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
9	GU0020249	LOCKHEED AIR TERMINAL	5172	0.1	MINOR	8/27/82	8/ /82	7/ /87
9	GU0020257	COCUS ISLAND RESORT	7011	0.1	MINOR	/ /	8/ /83	8/ /88
9	GU0110019	U.S. NAVY PUBLIC WORKS	9711	3.2	MAJOR	1/31/75	11/ /88	11/ /93
9	GU0110078	NAVY DEBALL	5093	0.37	MINOR	2/10/75	2/ /83	2/ /85
9	GU0110124	USN, SUPPLY	5093	0.1	MINOR	/ /	8/ /83	8/ /88
9	HI0000019	KAHE 1-5	4911	647	MAJOR	6/02/74	6/ /83	3/ /88
9	HI0000027	HONOLULU 5, 7-9	4911	304	MAJOR	12/27/74	6/01/83	2/28/87
9	HI0000078	PIONEER MILL CO.	REFI	0.5	MINOR	11/30/73	8/ /77	8/ /82
9	HI0000086	KEKAHA SUGAR CO.	CANE	99.1	MINOR	11/30/73	10/ /82	8/ /87
9	HI0000116	OKOKELE SUGAR CO.	REFI	2	MINOR	11/30/73	10/ /82	8/ /87
9	HI0000124	LIHUE PLANATION CO.	REFI	3	MINOR	11/30/73	10/ /82	8/ /87
9	HI0000159	HAMAKUA SUGAR CO. INC.	REFI	4.1		10/21/73	3/ /85	2/ /90
9	HI0000191	HILO COAST PROCESS. CO.	RAW	20.19	MAJOR	10/21/73	3/ /85	2/ /90
9	HI0000256	KONOKAA SUGAR CO.	REFI	14	MAJOR	10/21/73	3/ /85	2/ /90
9	HI0000329	CHEVRON	PETR	5.3	MAJOR	3/15/73	5/ /83	3/ /88
9	HI0000353	CITIZENS UTILITIES	4911	10.8	MAJOR	12/27/74	6/ /83	3/ /88
9	HI0000361	MCBRIDE SUGAR CO.	CANE	0.375	MINOR	11/30/73	10/ /82	8/ /87
9	HI0000582	SHELL OIL CO. (HONOLULU)	5171	0.023	MINOR	10/31/73	10/ /83	9/ /88
9	HI0000612	HI DEPT. OF HEALTH	8062	0.15	MINOR	1/11/74	11/ /83	10/ /88
9	HI0000663	PACIFIC RESOURCES	5171	0.0005	MINOR	10/31/73	11/ /83	10/ /88
9	HI0020109	COUNTY OF HONOLULU WAIA	4952	1.72	MAJOR	5/24/74	7/ /86	3/ /91
9	HI0020117	HONOLULU C&C	4952	82	MAJOR	8/22/75	6/ /83	4/ /88
9	HI0020141	HONOLULU C&C	4952	7	MAJOR	6/28/74	2/ /82	1/ /87
9	HI0020150	HONOLULU C&C	4952	4.3	MAJOR	12/05/74	2/ /82	1/ /87
9	HI0020176	CO. OF HAWAII	4952	7	MAJOR	3/13/75	11/ /83	6/ /87
9	HI0020184	COUNTY OF MAUI-LAHAINA	4952	3.2	MAJOR	12/18/74	9/01/84	8/31/89
9	HI0020257	COUNTY OF KAUAI-WAILUA	4952	0.5	MAJOR	4/03/74	8/ /87	1/ /92
9	HI0020265	COUNTY OF KAUAI-ELEELE	4952	0.4	MINOR	12/27/74	5/ /83	4/ /88
9	HI0020303	EAST HONOLULU COMMUNITY SERVICE	4952	3.9	MAJOR	4/03/74	1/ /84	12/ /88
9	HI0020478	ZIONS SECURITIES	4952	0.133	MINOR	3/05/75	5/ /80	5/ /85
9	HI0020630	WAIKIKI AQUARIUM	8421	0.6	MINOR	10/22/75	6/ /85	7/ /90
9	HI0020656	HAWAIIAN MILLING CO.	2431	0.1	MINOR	4/01/76	1/ /86	12/ /90
9	HI0020711	ALA WAI MARINE LTD.	3732	0.1	MINOR	2/02/76	5/ /86	4/ /91
9	HI0020770	COUNTY OF HAWAII KULAIMANO	4952	0.5	MINOR	6/01/78	6/ /83	5/ /88
9	HI0020796	AMEROA HCHD	1452	0.027	MINOR	8/16/79	6/ /84	5/ /89
9	HI0020834	DEL MARK CORP.	0179	0.05		12/01/79	11/ /84	10/ /89
9	HI0020877	HONOLULU C&C	4952	25	MAJOR	10/31/80	7/ /85	6/ /90
9	HI0020893	NATURAL ENERGY LAB	7391	0.1	MINOR	4/01/81	4/ /86	3/ /91
9	HI0020923	CHEVRON U.S.A INC. (HONOLULU MAIN)	5171	0.1	MINOR	6/29/81	6/ /86	5/ /91
9	HI0020931	CHEVRON U.S.A INC. (HONOLULU T)	5171	0.1	MINOR	6/29/81	6/ /81	5/ /86
9	HI0020940	CHEVRON U.S.A INC. (KAPALANA T)	5171	0.1	MINOR	6/29/81	6/ /86	5/ /91
9	HI0020958	LANAI OIL CO.	5171	0.1	MINOR	6/29/81	6/ /86	5/ /91
9	HI0020991	PAULEY PETROLEUM, INC.	5171	0.1	MINOR	7/01/81	6/ /86	6/ /91
9	HI0021008	AKONA PETROLEUM	5171	0.1	MINOR	/ /	11/ /82	11/ /87
9	HI0021083	HAWAIIAN CEMENT	5039	0.1	MINOR	/ /	6/ /86	5/ /91
9	HI0021113	CO. OF HAWAII (PAPLKAU PAUKOA)	8091	0.1	MINOR	/ /	7/ /86	6/ /91
9	HI0021121	CHEVRON U.S.A INC.(KAHULUI TERRAL)	2911	0.1	MINOR	/ /	10/ /86	5/ /91
9	HI0110078	U.S. MARINE CORPS KANEO	9711	2	MAJOR	11/28/74	9/ /84	8/ /89
9	HI0110086	U.S. NAVY FORT KAMEHAME	9711	7.5		/ /	/ /	/ /
9	NI0020010	CUC, SADOL, TASI STP	4952	0.3	MAJOR	1/31/75	9/ /85	9/ /90
9	NI0020028	CUC, AGINGAN STP	4952	1	MAJOR	1/31/75	9/ /85	9/ /90
9	NI0020117	MOBIL OIL. ROTA, CNMI	5171	0.1	MINOR	1/26/75	9/ /84	5/ /89
9	NI0020125	MOBIL OI. SAIPAN, CNMI	5171	0.0005	MINOR	1/26/75	9/ /84	5/ /89
9	NI0020133	MOBIL OIL, TINIAN, CNMI	5171	0.0002	MINOR	1/26/75	9/ /84	5/ /89
9	NI0020290	HARA ADAI HOTEL, CNMI	7017	0.1	MINOR	2/15/83	2/ /83	2/ /88
9	TT0020061	DPW, MALAKIAL STP, ROP	4952	1	MINOR	1/31/73	9/ /85	9/ /90
9	TT0020095	MOBIL OIL, PALAU	5171	0.0005	MINOR	1/25/75	9/ /84	5/ /89
10	AK0029840	PRUDHOE BAY WATERFLOOD PROJECT	1381	9	MAJOR	12/17/80	9/30/86	10/31/91
10	AK0038661	ENDICOTT DEVELOPMENT	1381	1.3	MAJOR	/ /	1/22/86	2/21/91
10	AK0040487	SHEE ATIKA	2411		MAJOR	/ /	6/03/85	7/02/90
10	AK0043192	WESTGOLD	1041	47.8		/ /	9/13/85	10/13/88
10	AK0043354	KUPARUK WATERFLOOD PROJECT	1381	1.65	MAJOR	/ /	9/24/85	10/23/90
10	AK0049379	WESTGOLD	1041		MAJOR	/ /	6/14/89	6/14/90
10	OR0000221	INTERNATIONAL PAPER CO	2631	6.97	MINOR	/ /	3/28/85	11/30/89

LIST OF DEFINITE 403(c) DISCHARGES (continued)

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
10	OR0001341	GEORGIA-PACIFIC CORP TOLEDO PAPER	2631	13.3		6/01/84	/ /	5/31/89
10	OR0022772	CITY OF NEWPORT	4952	2.47	MINOR	/ /	5/09/84	4/30/89
10	OR0023361	WEYERHAEUSER CO	2421	0.1	MINOR	/ /	3/27/87	3/31/92
10	WA0025585	QUINALT INDIAN NATION	4952	1	MINOR	/ /	NYI	/ /

Appendix E

List of General 403(c) NPDES Permits

	Permit	Coverage Area	Expiration Date
<u>Region IV & VI</u>			
GMG280000	Final NPDES General Permit for the Outer Continental Shelf (OCS) of the Gulf of Mexico (51 FR 24897)	Coverage area includes facilities located in and discharging to the Gulf of Mexico seaward of the outer boundary of the territorial seas of the states bordering the Gulf	7/1/91
TX0085651	General Permit Texas Coast-Production Existing Producers	Coverage - Territorial Sea of Texas	Expired 7/15/88
LA0060224	General Permit - Louisiana Coast- Production Existing Producers	Coverage - Territorial Sea of LA	Expired 7/15/88
<u>Region IX</u>			
CAG280605	Draft General NPDES Permit for Offshore Oil and Gas Exploration Activities off Southern California (50 FR 34036)	Coverage Area includes Federal Waters off southern California	Not yet issued final.
CAG280622	Draft General NPDES Permit for Offshore Oil and Gas Development and Production Activities off Southern California (50 FR 34052)	Coverage area includes Federal waters off Southern California	Not yet issued final.
CA0110516	Final General NPDES Permit for oil and gas exploration and development (48 FR 55029)	Coverage Area includes Federal waters off Southern Californa.	6/30/84 (but extended via APA for facilities covered as of June 30, 1984)

	Permit	Coverage Area	Expiration Date
Region X			
AKG284100 Beaufort II	Final NPDES General Permit for Oil and Gas Operations on the Outer continental Shelf of Alaska: Beaufort Sea II and (Exploration)	Coverage area includes Federal and state waters. Exploratory drilling only. Proposed modification for covered area 5/1/89	9/27/93
AKG288000 Chukchi	Final NPDES General Permit for Oil and Gas Operations on the Outer Continental Shelf of Alaska: Chukchi Sea	Coverage area includes Federal and state waters. Exploratory drilling only.	9/27/83
AKG283000 Bering Sea	Final NPDES General Permit for Oil and Gas Operations on the Outer Continental Shelf and in State Waters of Alaska, Bering Sea (modification, 49 FR 23734; original permit, 52 FR 35461)	Coverage area includes Federal and state waters. Exploratory drilling only.	5/30/89
AKG285000	Final NPDES General Permit for Oil and Gas Operations on the Outer Continental Shelf of Alaska: Cook Inlet Sea/Gulf of Alaska (51 FR 35460)	Development and production discharges are authorized to state waters north of the Forelands in Upper Cook Inlet. Exploratory facilities are authorized to discharge to state and Federal offshore and state inland coastal waters. Receiving waters are Cook Inlet, Shelikof Strait, and the Gulf of Alaska.	10/10/91
AKG287000	Norton Sound (50 FR 23578)	Federal Lease Sale 57. Exploratory drilling only.	5/29/90
AKG520000	Alaska Seafood Processors. Mobile and shore-based facilities.	Waters of the state of Alaska and adjacent U.S. waters. Currently about 290 processors are covered. As many as 150 more may be covered by the reissued permit.	6/18/89

Appendix F

List of "Questionable" 403(c) Discharges

LIST OF QUESTIONABLE 403(c) DISCHARGES

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
9	MW0110001	US NAVY, NAVAL AIR FACILITY		0.32	MINOR	9/29/75	9/ /82	7/ /87
10	AK0000124	CHEVRON USA INC	5171	0.1	MINOR	/ /	6/30/79	6/30/79
10	AK0000523	KETCHIKAN	5171	0.1	MINOR	/ /	12/17/74	6/30/79
10	AK0000604	KODIAK SUPPORT CTR (POWER PLT)	4911	0.1	MINOR	/ /	11/15/74	6/30/79
10	AK0000914	KETCHIKAN SPRUCE MILLS	2421	0.1	MINOR	/ /	5/27/75	3/31/80
10	AK0000922	KETCHIKAN PULP CO	2611	.	MAJOR	/ /	12/28/84	1/29/90
10	AK0001201	WRANGELL SAWMILL (POWER PLANT)	4911	0.1	MINOR	/ /	1/15/75	10/31/79
10	AK0001210	WRANGELL 6-MILE SAWMILL	2421	0.1	MINOR	/ /	1/15/75	9/01/79
10	AK0001449	SEALSKIN PROCESSING PLANT	9512	0.1	MINOR	/ /	12/17/74	11/30/79
10	AK0001457	POWER PLANT	4911	0.1	MINOR	/ /	12/17/74	11/30/79
10	AK0001465	SEAL CARCASS PROCESSING PLANT	9512	0.1	MINOR	/ /	12/17/74	11/30/79
10	AK0001473	SEAL SKIN PROCESSING PLANT	9512	0.1	MINOR	/ /	12/17/74	11/30/79
10	AK0020133	PETERSBURG LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	10/31/79
10	AK0020281	DOD-NA Adak Naval Stati	9711	0.1	MINOR	/ /	12/21/73	12/20/78
10	AK0020311	DOD-NA Naval Security G	9711	0.1	MINOR	/ /	12/28/73	12/27/78
10	AK0020320	DOD-NA Adak Naval Stati	9711	0.1	MINOR	/ /	12/28/73	12/27/78
10	AK0020532	COLD BAY FAA STATION (STP)	4952	1	MINOR	/ /	1/18/74	8/01/77
10	AK0020591	ANNETTE ISLAND STP	4952	1	MINOR	/ /	12/13/74	6/30/77
10	AK0020630	ATTU LORAN STATION (STP)	4952	1	MINOR	/ /	12/14/73	12/14/78
10	AK0020648	KODIAK SUPPORT CENTER (STP)	4952	1	MINOR	/ /	9/27/79	10/29/84
10	AK0020672	PETERSBURG MOORINGS (STP)	4952	1	MINOR	/ /	12/14/73	8/01/77
10	AK0020681	KETCHIKAN BASE (STP)	4952	1	MINOR	/ /	12/14/73	12/14/78
10	AK0020699	ROLAND VILLAGE (STP)	4952	1	MINOR	/ /	12/14/73	12/14/78
10	AK0020737	SPRUCE CAPE LORAN STATION (STP)	4952	1	MINOR	/ /	12/14/73	12/14/78
10	AK0020753	FIVE FINGER LIGHT STATION (STP)	4952	1	MINOR	/ /	12/14/73	12/14/78
10	AK0020907	DOD-AF Shemya AFB	9711	0.1	MINOR	/ /	12/28/73	9/30/78
10	AK0020931	CAPE ROMANZOF AFS (STP)	4952	1	MINOR	/ /	12/28/73	9/30/78
10	AK0020940	CAPE NEWENHAM AFS (STP)	4952	1	MINOR	/ /	12/28/73	9/30/78
10	AK0020958	KOTZEBUE AFS (STP)	4952	1	MINOR	/ /	12/28/73	9/30/78
10	AK0020991	DOD-AF Cold Bay AFS	9711	0.1	MINOR	/ /	12/28/73	9/30/78
10	AK0021008	CAPE LISBURNE AFS (STP)	4952	1	MINOR	/ /	12/28/73	9/30/78
10	AK0021016	TIN CITY AFS (STP)	4952	1	MINOR	/ /	12/28/73	9/30/78
10	AK0021211	CITY OF KODIAK	4941	0.1	MINOR	/ /	/ /	/ /
10	AK0021407	AUKE BAY STP	4952	1	MINOR	/ /	7/10/74	12/31/78
10	AK0021407	AUKE BAY STP	4952	1	MINOR	/ /	7/10/74	12/31/78
10	AK0021440	CITY OF KETCHIKAN	4952	5.36	MAJOR	/ /	7/12/84	8/14/89
10	AK0021482	METLAKATLA STP	4952	1	MINOR	/ /	10/11/74	6/30/79
10	AK0021491	CITY OF CRAIG	4952	1	MINOR	/ /	10/25/74	6/30/77
10	AK0021504	CITY OF KLOWOCK	4952	1	MINOR	/ /	10/25/74	6/30/79
10	AK0021521	TATITLEK VILLAGE COUNCIL	4952	1	MINOR	/ /	10/25/74	12/31/76
10	AK0021555	SEWAGE SCREENING FACILITY	4952	2.13	MAJOR	/ /	3/11/88	4/12/93
10	AK0021652	S & S DEVELOPMENT CO	4952	1	MINOR	/ /	/ /	/ /
10	AK0021792	KETCHIKAN GATEWAY BOROUGH AIRPORT	4582	0.1	MINOR	/ /	12/13/74	8/31/79
10	AK0021806	KUIU ISLAND LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	8/31/79
10	AK0021814	HECETA ISLAND LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	9/30/89
10	AK0021822	CHICHAGOF ISLAND LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	8/31/79
10	AK0021881	HANUS BAY LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	8/31/79
10	AK0021890	LOWELL POINT FACILITY	4952	0.96	MAJOR	/ /	6/26/86	7/29/91
10	AK0022047	THORNE BAY ADMIN SITE (STP)	4952	1	MINOR	/ /	12/12/77	1/12/83
10	AK0022136	BARLETT COVE RANGER STA. (STP)	4952	1	MINOR	/ /	2/20/74	12/31/78
10	AK0022519	CITY OF OLD HARBOR	4952	1	MINOR	/ /	10/25/74	12/31/76
10	AK0022616	WRANGELL INSTITUTE	8211	0.1	MINOR	/ /	1/30/74	6/30/79
10	AK0022659	MT. EDGCUMBE SCHOOL (STP)	4952	1	MINOR	/ /	2/27/74	8/01/77
10	AK0022748	NEWTOK DAY SCHOOL (STP)	4952	1	MINOR	/ /	2/27/74	12/31/78
10	AK0022870	SAVOONGA DAY SCHOOL (STP)	4952	1	MINOR	/ /	2/27/74	11/30/78
10	AK0022926	CASCADE CREEK ADMIN SITE(STP)	4952	1	MINOR	/ /	2/27/74	8/31/77
10	AK0023213	DOUGLAS WTP	4952	2.76	MAJOR	/ /	9/10/85	10/09/90
10	AK0023299	WHITTIER TERMINAL	4011	0.1	MINOR	/ /	1/30/74	8/01/77
10	AK0023400	ZAREMBO ISLAND LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	8/31/79
10	AK0023594	AUKE VILLAGE RECREATION (STP)	4952	1	MINOR	/ /	6/26/74	12/31/78
10	AK0023671	SUNNY POINT CANNERY-FISH CAMP	4952	1	MINOR	/ /	12/13/74	6/30/79
10	AK0023701	NOYES ISLAND PLANT-FISH CAMP	4952	1	MINOR	/ /	12/13/74	6/30/79
10	AK0023817	FALSE PASS YACC CAMP (STP)	4952	1	MINOR	/ /	8/22/75	8/31/79
10	AK0023825	KAKE LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	8/31/79

LIST OF QUESTIONABLE 403(c) DISCHARGES (continued)

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
10	AK0023841	YAKUTAT FAA STATION (STP)	4952	1	MINOR	/ /	6/26/74	11/30/78
10	AK0023914	TUXEKAN PASSAGE LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	9/30/79
10	AK0023973	SHRUBBY ISLAND LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	8/31/79
10	AK0024015	COFFMAN COVE- KETCHIKAN	1611	0.1	MINOR	/ /	10/10/75	9/30/79
10	AK0024031	WRANGELL LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	9/30/79
10	AK0024058	THORNE BAY LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	9/30/79
10	AK0024066	KOSCIUSKO ISLAND LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	10/31/79
10	AK0024074	TUXEKAN PASSAGE LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	9/30/79
10	AK0024082	ORR ISLAND LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	9/30/79
10	AK0024180	WHALE PASSAGE LOGGING CAMP	4952	1	MINOR	/ /	10/10/75	9/30/79
10	AK0024228	OWENS DRILLING CO	1611	0.1	MINOR	/ /	8/22/75	9/30/79
10	AK0024244	KETCHIKAN LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	8/31/79
10	AK0024392	PEKOVICH, ANDREW W	4952	1	MINOR	/ /	/ /	/ /
10	AK0024627	RESIDENTIAL SUBDIVISION	4952	1	MINOR	/ /	12/17/74	8/31/79
10	AK0024724	SPRUCE CAPE TRAILER COURT	6515	0.1	MINOR	/ /	4/15/75	8/31/77
10	AK0024732	CITY OF PELICAN HIGH SCHOOL	8211	0.1	MINOR	/ /	4/22/75	1/01/77
10	AK0024741	CITY OF HYDABURG	4952	1	MINOR	/ /	5/17/76	11/30/79
10	AK0024775	CITY OF HOONAH	4952	1	MINOR	/ /	1/20/78	2/20/83
10	AK0024899	KUIU ISLAND LOGGING CAMP	4952	1	MINOR	/ /	11/09/76	10/31/80
10	AK0024902	LABOUCHERE BAY LOGGING CAMP	4952	1	MINOR	/ /	8/22/75	7/31/80
10	AK0024911	KELP BAY LOGGING CAMP	4952	1	MINOR	/ /	8/11/76	9/13/81
10	AK0025160	WRANGELL LOGGING CAMP	4952	1	MINOR	/ /	11/09/76	9/30/80
10	AK0025666	CITY OF PORT LIONS	4952	1	MINOR	/ /	10/10/75	6/30/77
10	AK0025780	JENEAU	5171	0.1	MINOR	/ /	3/26/76	4/26/81
10	AK0025798	PETERSBURG	5171	0.1	MINOR	/ /	3/26/76	4/26/81
10	AK0025941	LBR INC	6515	0.1	MINOR	/ /	8/11/76	9/13/81
10	AK0026204		4952	1	MINOR	/ /	/ /	/ /
10	AK0026328	CHILKAT PENINSULA LOGGING CAMP	4952	1	MINOR	/ /	11/20/78	12/20/83
10	AK0026336	KELP BAY ADMIN SITE (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0026344	SHOAL COVE (FUEL STORAGE)	9621	0.1	MINOR	/ /	5/07/76	6/07/81
10	AK0026352	SHOAL COVE LORAN STATION (STP)	4952	1	MINOR	/ /	7/14/76	81/67/80
10	AK0026361	NARROW CAPE (FUEL STORAGE)	9621	0.1	MINOR	/ /	5/07/76	6/07/81
10	AK0026379	NARROW CAPE LORAN STATION(STP)	4952	1	MINOR	/ /	7/14/76	8/16/81
10	AK0026468	BARANOF IS. LOGGING CAMP(STP)	4952	1	MINOR	/ /	7/29/77	8/29/82
10	AK0026531	JACKSON, TT	4952	1	MINOR	/ /	/ /	/ /
10	AK0026671	GREEN LAKE PROJECT	1629	0.1	MINOR	/ /	/ /	/ /
10	AK0026905	MARGARET BAY CAMP	3531	0.1	MINOR	/ /	/ /	/ /
10	AK0027049	RESOURCE FACILITY	0921	0.1	MINOR	/ /	/ /	/ /
10	AK0027260	INBETWEEN CREEK LOGGING CAMP	4952	1	MINOR	/ /	/ /	/ /
10	AK0027456	SEWAGE TREATMENT PLANT	4952	1	MINOR	/ /	/ /	/ /
10	AK0027499	DIOMEDE DAY SCHOOL (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0027626	HOLLIS YACC CAMP (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0027731	NORANDA EXPLORATION INC.	1081	0.1	MINOR	/ /	/ /	/ /
10	AK0027952	HIDDEN FALLS SALMON HATCHERY	0921	0.1	MINOR	/ /	/ /	/ /
10	AK0028070	PETERSBURG TREE NURSERY	0821	0.1	MINOR	/ /	/ /	/ /
10	AK0028088	PORT ALICE CAMP	2421	0.1	MINOR	/ /	/ /	/ /
10	AK0028118	VERSTORIA PARK SUBDIVISION	4952	1	MINOR	/ /	/ /	/ /
10	AK0028291	HERRING COVE HATCHERY	0921	0.1	MINOR	/ /	/ /	/ /
10	AK0028312	BRUCE NEWLUN	4952	1	MINOR	/ /	/ /	/ /
10	AK0028525	TAMGAS CREEK SALMON MTCY	0921	0.1	MINOR	/ /	/ /	/ /
10	AK0028568	STARRIGAVAN TRAILER PARK	7519	0.1	MINOR	/ /	/ /	/ /
10	AK0028690	TENAKEE SPRINGS LOGGING CAMP	4952	1	MINOR	/ /	11/21/78	12/21/83
10	AK0028703	WRANGELL 6-MILE SM (REFUSE)	4953	1	MINOR	/ /	/ /	/ /
10	AK0028975	HENDERSON TRAILER COURT	7033	0.1	MINOR	/ /	/ /	/ /
10	AK0029017	STP FILL	4952	1	MINOR	/ /	/ /	/ /
10	AK0029149	CITY OF ANGOON	4952	1	MINOR	/ /	1/23/78	2/23/83
10	AK0029220	CHICHAGOF IS. LOG CAMP (STP)	4592	0.1	MINOR	/ /	7/29/77	8/29/82
10	AK0029254	CITY OF SAND POINT	4952	1	MINOR	/ /	10/14/77	11/14/82
10	AK0029327	DIV OF CHROMALLOY AMERICAN COR	1472	0.1	MINOR	/ /	/ /	/ /
10	AK0029424	CHICHAGOF ISLAND LOGGING CAMP	4952	1	MINOR	/ /	7/29/77	8/29/82
10	AK0029432	ROAD CONSTRUCTION CAMP (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0029441	KODIAK PACILITY	5171	0.1	MINOR	/ /	6/12/78	7/12/83
10	AK0029459	WRANGELL BULK PLANT	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0029777	SJ GROVES & SONS CO	1629	0.1	MINOR	/ /	/ /	/ /
10	AK0029785	ALASKA MARINE HIGHWAY SYSTEM	4952	1	MINOR	/ /	/ /	/ /

LIST OF QUESTIONABLE 403(c) DISCHARGES (continued)

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
10	AK0029831	CHARLES A SMITH	4952	1	MINOR	/ /	/ /	/ /
10	AK0029980	MAIN BAY HATCHERY	0921	0.1	MINOR	/ /	/ /	/ /
10	AK0030783	KUPERANOF ISLAND LOGGING CAMP	4952	1	MINOR	/ /	/ /	/ /
10	AK0030872	ARCO OIL & GAS CO	1799	0.1	MINOR	/ /	/ /	/ /
10	AK0030881	SITKA LOGGING CAMP	4952	1	MINOR	/ /	/ /	/ /
10	AK0030911	NORTHWEST ARCTIC SCHOOL DIST	8211	0.1	MINOR	/ /	/ /	/ /
10	AK0030953	ITT RAYONIER	4952	1	MINOR	/ /	/ /	/ /
10	AK0030961	PERRY & JULIE COBURN	4952	1	MINOR	/ /	/ /	/ /
10	AK0030970	SHOE INLET	4952	1	MINOR	/ /	/ /	/ /
10	AK0030988	SEALASKA TIMBER CORP.	4952	1	MINOR	/ /	/ /	/ /
10	AK0031020	AMOCO PRODUCTION CO	1311	0.1	MINOR	/ /	/ /	/ /
10	AK0031101	HOBART BAY	4952	1	MINOR	/ /	/ /	/ /
10	AK0031119	PORT FREDERICK	4952	1	MINOR	/ /	/ /	/ /
10	AK0031429	KODIAK SUPPORT CTR(REFUELING)	4582	0.1	MINOR	/ /	/ /	/ /
10	AK0031534	SITKA SOUND HATCHERY	0921	0.1	MINOR	/ /	/ /	/ /
10	AK0031577	SEWAGE TREATMENT FACILITY	4952	1	MINOR	/ /	/ /	/ /
10	AK0031585	NATZUHINI LOGGING CAMP	4952	1	MINOR	/ /	/ /	/ /
10	AK0031682	HARBOR VIEW SUBDISION	4952	1	MINOR	/ /	/ /	/ /
10	AK0031739	CHEVRON USA INC	1382	0.1	MINOR	/ /	/ /	/ /
10	AK0031780	DAVID COX INC	4952	1	MINOR	/ /	/ /	/ /
10	AK0031879	AIRPORT TERMINAL	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0035131	KOSCIUSKO IS. LOG CAMP (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0035149	DBA SITKA SUILDERS	1541	0.1	MINOR	/ /	/ /	/ /
10	AK0035670	CHEVRON USA INC	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0035921	CHEVRON USA INC	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0035939	CHEVERON USA INC.	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0035963	CHEVRON USA INC.	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0036030	CHEVRON USA INC	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0036048	CHEVRON USA INC	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0036072	CHEVRON USA INC.	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0036986	CHEVRON USA INC	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0037036	CHEVRON USA INC	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0037087	EXXON CORP SEWAGE TREATMENT PL	4952	1	MINOR	/ /	/ /	/ /
10	AK0037273	HOONAH LOGGING CAMP	4952	1	MINOR	/ /	/ /	/ /
10	AK0039605	CHEVRON USA INC	5171	0.1	MINOR	/ /	/ /	/ /
10	AK0039683	GULF OIL EXPLO & PROD CO	1311	0.1	MINOR	/ /	/ /	/ /
10	AK0040584	KETCHIKAN GATEWAY BOROUGH	4952	1	MINOR	/ /	/ /	/ /
10	AK0040622	SUNEEL ALASKA CORP.	4463	.	MAJOR	/ /	9/26/84	10/25/89
10	AK0042391	AUK NU CONDOMINIUMS	1522	0.1	MINOR	/ /	/ /	/ /
10	AK0042404	COFFMAN COVE ADMIN SITE (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0043117	CHANNEL VIEW APARTMENTS	6513	0.1	MINOR	/ /	/ /	/ /
10	AK0043176	SUNSET DRIVE SUBDIVISION	1522	0.1	MINOR	/ /	/ /	/ /
10	AK0043371	LOWER THORNE BAY ADMIN (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0043401	FRITZ COVE SO HOMEOWNERS ASSOC	1522	0.1	MINOR	/ /	/ /	/ /
10	AK0043427	CITY OF ST. GEORGE	4952	1	MINOR	/ /	/ /	/ /
10	AK0043451	SEWAGE TREATMENT PLANT	4952	1	MINOR	/ /	10/19/87	10/19/92
10	AK0043559	BURNETT INLET SALMON HATCHERY	0921	0.1	MINOR	/ /	/ /	/ /
10	AK0043855	FUTURE RESIDENTIAL DEVELOPMENT	4952	1	MINOR	/ /	/ /	/ /
10	AK0043885	FUTURE RESIDENTIAL DEVELOPMENT	4952	1	MINOR	/ /	/ /	/ /
10	AK0044334	CITY OF KING COVE	4952	1	MINOR	/ /	/ /	/ /
10	AK0044474	SOUTH COAST INC	4952	1	MINOR	/ /	/ /	/ /
10	AK0044598	KIC/ASRC WETLANDS	1382	0.1	MINOR	/ /	1/21/86	2/20/91
10	AK0044741	GOLD NUGGET SUBDIVISION	4952	1	MINOR	/ /	/ /	/ /
10	AK0044750	HYDROSTATIC TEST	1389	0.1	MINOR	/ /	/ /	/ /
10	AK0044768	FAMILY RESIDENCE	4952	1	MINOR	/ /	/ /	/ /
10	AK0044938	CIDS-ICE MELTING TEST	1382	0.1	MINOR	/ /	3/31/86	6/30/88
10	AK0044954	SHOAL COVE ADMIN SITE (STP)	4952	1	MINOR	/ /	9/22/86	10/21/91
10	AK0044962	WHALE PASSAGE AMDIN SITE(STP)	4952	1	MINOR	/ /	9/22/86	10/21/91
10	AK0045071	NORTH SHORE SUB DIVISION	1521	0.1	MINOR	/ /	/ /	/ /
10	AK0045314	KODIAK INTERNATIONAL SHIPWORKS	3731	0.1	MINOR	/ /	/ /	/ /
10	AK0045543	'JET' AERATION TREATMENT PLANT	4952	1	MINOR	/ /	/ /	/ /
10	AK0045551	KNUDSON COVE SUBDIVISION	6552	0.1	MINOR	/ /	/ /	/ /
10	AK0045560	COMMERCIAL FISHING RESORT	7011	0.1	MINOR	/ /	/ /	/ /
10	AK0045624	SEWAGE TREATMENT FACILITY	4952	1	MINOR	/ /	/ /	/ /
10	AK0045632	JET AERATION TREATMENT PLANT	4952	1	MINOR	/ /	/ /	/ /

LIST OF QUESTIONABLE 403(c) DISCHARGES (continued)

EPA Region	NPDES Number	Discharge Name and/or Location	SIC Code	Flow (MGD)	Major Minor	Original Date	Reissue Date	Expire Date
10	AK0045675	KETCHIKAN SHIPYARD DRY DOCK	3731	0.1	MINOR	/ /	/ /	/ /
10	AK0045683	SEWARD SHIP HAUL OUT/REPAIR	3731	0.1	MINOR	/ /	/ /	/ /
10	AK0046655	INDIAN HEALTH SERVICE PROJECT	4952	1	MINOR	/ /	/ /	/ /
10	AK0046831	AGRICULTURE, FOREST SERVICE	4952	1	MINOR	/ /	/ /	/ /
10	AK0046833	COMMERCIAL FISHING RESORT	4952	1	MINOR	/ /	/ /	/ /
10	AK0046876	METLAKATLA WATER TREATMENT	4941	0.1	MINOR	/ /	/ /	/ /
10	AK0046884	JET AERATION STP	4952	1	MINOR	/ /	/ /	/ /
10	AK0047279	SPRING CREEK CORRECTIONAL CTR.	4952	1	MINOR	/ /	9/28/87	9/28/92
10	AK0047295	HECETA ISLAND CAMP BARGE (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0047554	SINGLE-FAMILY DWELLING (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0047597	ONSITE ENERGY	4911	0.1	MINOR	/ /	/ /	/ /
10	AK0047601	PELICAN/MUSSEL HEIGHTS SUBDIVI	4952	1	MINOR	/ /	/ /	/ /
10	AK0047635	SEWERAGE SYSTEMS	4952	1	MINOR	/ /	/ /	/ /
10	AK0047741	FLOAT HOUSE	4952	1	MINOR	/ /	/ /	/ /
10	AK0047872	CONTRACT 52-ABNC 8 00012	8922	0.1	MINOR	/ /	/ /	/ /
10	AK0048291	THORNE BAY FACILITY (SEWAGE)	4952	1	MINOR	/ /	/ /	/ /
10	AK0048305	KENSINGTON VENTURE (SEWAGE)	4952	1	MINOR	/ /	/ /	/ /
10	AK0048361	BONNIE BRAE SUBDIVISION (STP)	4952	1	MINOR	/ /	/ /	/ /
10	AK0048372	FISH-HANDLING PLANT (SEWAGE)	4952	1	MINOR	/ /	/ /	/ /
10	AK0048437	RESIDENTIAL SEWER OUTFALL	4952	1	MINOR	/ /	/ /	/ /
10	AK0048542	WRANGELL LATTER DAY SAINTS CHURCH	4952	1	MINOR	/ /	/ /	/ /
10	AK0048682	JET AERATION TREATMENT PLANT	4953	1	MINOR	/ /	/ /	/ /
10	AK0048721	SEWER SYSTEM	4952	1	MINOR	/ /	/ /	/ /

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Private Use $300